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## INTRACRANIAL COMPLICATIONS OF CHRONIC SUPPURATIVE OTITIS MEDIA, AS SEEN BY THE OPHTHALMOLOGIST.

RALPH A. FENTON, M.D.

PORTLAND, OREGON.

Otitic intracranial complications may become related to the eye thru: 1. The blood stream; 2. Cavities and spaces about the brain; (a) The epidural space, (b) The subarachnoid space. 3. Connections of the sensory and motor nervous system; 4. Connections of the sympathetic nervous system. This paper discusses the topographic anatomy of these routes, by diagrams. Clinical evidence and interpretation of lesions along each route; a resumé of eye conditions observed synchronously with suspected intracranial complications; and special considerations regarding nystagmus; paralyses; neuritis and choked disc; and visual disturbances. Given before the Section on Instruction, American Academy of Ophthalmology and Oto-Laryngology, Chicago, October 22, 1925.

Perhaps the most vivid method of recalling the reasons for eye symptoms which may be important in the diagnosis of intracranial complications of otitis, will be that of the topographic anatomist. We shall attempt this by showing certain rather crude diagrams, each detailing a particular set of relations as seen thru the transparent skull.

The ear and eye are related by five rather distinct routes of communication: the blood stream; the cavities and spaces about the brain, epidural and subarachnoid; the sensory and motor nerve connections; and those of the sympathetic nervous system. We shall examine each of these routes, with such clinical signals as may arise from disturbance along each line.

### THE VENOUS SINUSES.

Blood from the brain pours thru the sigmoid sinus past the mastoid, receiving the superior and inferior petrosal sinuses with their anterior connection to the cavernous sinus and basilar plexus (Fig. 1). Thrombosis in the lateral sinus may cause two kinds of eye symptoms. The first includes those arising from emboli, pieces of clot or groups of bacteria, pumped into the arterial system after floating away from a mural thrombus. Such embolic phenomena might give rise to obstruction in retinal arterioles, to multiple retinal hemorrhages, with corresponding ophthalmoscopic ap-

pearances and visual field disturbances; and, in the ciliary circulation, to episcleritic nodules, or to iritis, or possibly even metastatic choroiditis and panophthalmitis.

Temperature reaction, blood culture, and other methods of identifying septicemia are needed in such cases; numerous cases of confusion with malaria; typhoid and tuberculosis are recorded. Furthermore, great care will be needed in distinguishing such retinal phenomena from those arising from acute nephritis, itself not an infrequent sequence of severe disease of the temporal bone.

The second, and far more commonly recognized group of circulatory symptoms, arises from obstruction to the outflow of blood, due to complete plugging of the lateral sinus by a thrombus, perhaps with retrograde extension of the thrombotic process into the petrosals; or even into the longitudinal or cavernous sinus, or the carotid plexus.

Depending upon the diminished outlet for the retinal circulation and upon the extent to which collateral drainage to the opposite jugular takes place, we shall find all degrees of intraocular venous stasis. This may range from slight unilateral pinkness of the nerve-head, or blurring of its borders, to a distinct neuritic swelling with engorged veins. Uhthoff<sup>2</sup> states that 24 per cent of cases of otogenic sinus thrombosis present optic neuritis, without pro-



nounced papilledema. These he classifies as follows:

	Per cent of neuritis
Uncomplicated sinus thrombosis..	22
Thrombosis complicated by meningitis .....	30
Thrombosis complicated by meningitis and brain abscess.....	12
Thrombosis complicated by meningitis and pachymeningitis...	2
Thrombosis complicated by brain abscess .....	20
Thrombosis complicated by extradural abscess.....	14

He further reported 18 per cent of otogenic sinus thrombosis cases showing choked disc. In general this appeared sooner and was worse on the side of the affected ear, as follows:

	Per cent of choked disc
Uncomplicated sinus thrombosis..	25
Thrombosis complicated by meningitis .....	33
Thrombosis complicated by perisinus and subdural abscess.....	20
Thrombosis complicated by brain abscess .....	15
Thrombosis complicated by brain abscess and leptomeningitis....	7

White's<sup>4</sup> recent study showed 40 per cent of thrombosis cases with various grades of papilledema. Hansen's<sup>10</sup> clinic reported optic nerve involvement in 37.5 per cent of uncomplicated, and 47.6 per cent of complicated sinus thrombosis cases. Uhthoff warns against the impropriety of using apparent venous stasis or retinal hyperemia (in 10 per cent of such cases) as a sole indication for intracranial operation. Filling of veins observed ophthalmoscopically when the sound jugular is compressed has, however, long been used as a test for occlusive thrombosis, and lacks the dangers of clot detachment inherent in the Quickensted and Tobey compression with spinal puncture.

Such visual disturbance as arises in cases of sinus thrombosis is uncommon, and due usually to increase of intraocular pressure thru compression or damming of the arteries of the optic nerve and retina. Rarely, there is associated or independent thrombosis or compression of the retinal veins. Choking in such cases usually occurs with such rapidity that atrophy does not

occur if speedy operative relief is at hand. True atrophy in such cases is rare.<sup>3-5</sup>

It must not be forgotten that neuritis or choking may get much worse for a few days following jugular ligation, with gradual improvement as collateral circulation is established.<sup>18</sup> Rarely, this increase has become so serious as to cause blindness, perhaps from an acute internal hydrocephalus.<sup>22</sup>

Exophthalmos from otitic thrombosis is far less common than from thrombosis arising from nasal or facial sepsis. The classic signs of cavernous thrombosis include swelling of the face and lids, chemosis, cyanosis, proptosis from orbital edema and phlegmon, paresis of the ocular musculature and severe trigeminal pain. The ascending infection may travel from the ear by the carotid venous plexus, or from either of the petrosal sinuses.

Ophthalmic paralyses, in Uhthoff's series, occurred in 12 per cent of sinus thrombosis cases; in these a little less than half had other complications as well. Abducens palsy was found in two-thirds of such cases; and partial oculomotor loss, usually of the levator palpebrae, in about half. No fourth nerve cases were noted, and conjugate deviation was rarely observed. Nystagmus was reported in 12 per cent of sinus thrombosis cases.<sup>2</sup>

Of the spaces about the brain which relate the eye and ear, the epidural space rarely conditions ocular symptoms. Nevertheless, accumulation of exudate, epidural abscesses and the like, have occasionally been reported as extending directly along the middle fossa; and thus effecting an entrance into the orbit thru the superior orbital fissure. Such cases have usually been in young children, with numerous cartilaginous dehiscences, and are also reported in persons with tuberculosis, or diabetes. Orbital cellulitis of this type is of course excessively grave, with multiple muscular palsies.

In chronic suppuration, with sequestration of the inner or anterior part of the petrous pyramid, careless washing or inept instrumentation have been known to precipitate massive epidural invasion, either from an anterior cell



group along the carotid canal, or others about the petrous tip and semilunar ganglion.

In these cases involvement of the fifth nerve may cause severe lid and forehead pains, herpes zoster, loss of corneal and conjunctival sensation, even loss of taste and of teeth on the

ment of the blind spot; and to interlacement or reversal of the diminished color fields, from the increased intracranial pressure. (Bordley and Cushing.<sup>8</sup>)

#### THE SUBARACHNOID SPACE.

Far more important in the etiology of eye symptoms is that vast reservoir

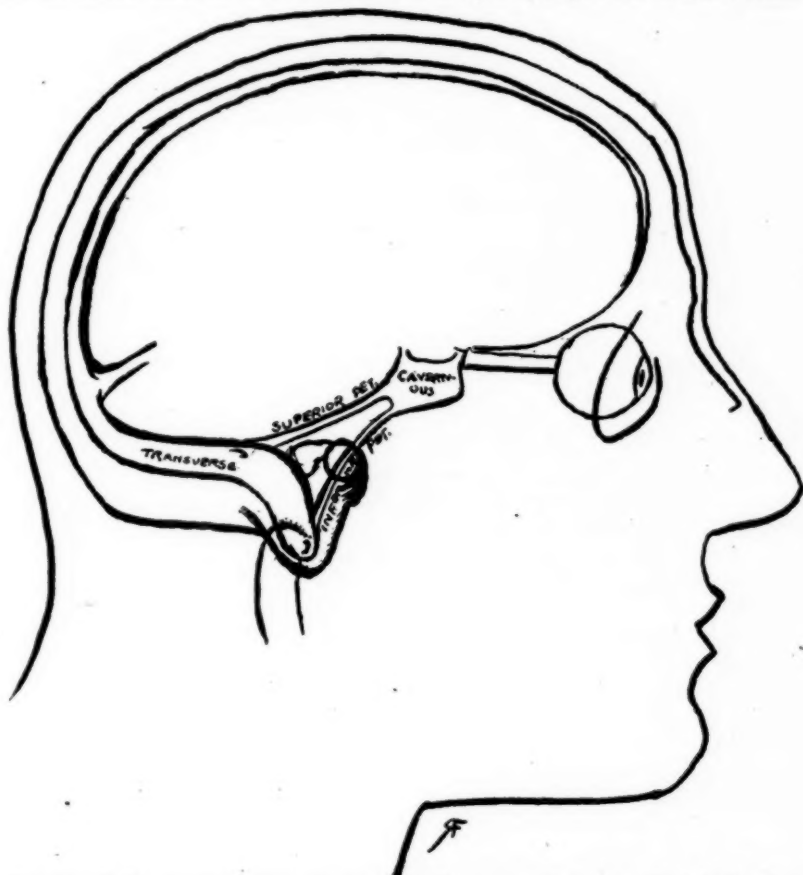


Fig. 1. Diagram of the venous sinuses concerned in the propagation of septic infection from the ear toward the eye.

same side. The corneal insensitivity has its usual train of inflammation, ulcer, vascularization and symblepharon.

Prolonged epidural accumulation near the chiasm may, occasionally, bring about an accumulation of fluid around the optic nerve, between the nerve and its dural envelope—a true perineuritis. If prolonged, this will of course become manifest upon ophthalmoscopic examination; but visual evidence is likely to be preceded by a stage of concentric contraction of the form field. This may go on to enlarge-

of cerebrospinal fluid, the subarachnoid space. Long ago mapped out in serial section reconstructions by Key and Retzius,<sup>9</sup> this complicated system of cavities (Fig. 2) has recently been accurately visualized by Naffziger of San Francisco.<sup>10</sup> After injection of celloidin-acetone, the soft parts are removed by acid, leaving highly detailed and very delicate celloidin casts of the subarachnoid cisterns at the base of the brain and about the hemispheres.

Most important for the otologist and ophthalmologist is the mapping of side-to-side communications between

the petrous tips, and of the little sleeve-like prolongations of the basal cisterns, accompanying each cranial nerve to its foramen of exit. Such a space had of course long been recognized (Magendie, 1842) about the first, second and fifth nerves. Its existence accounts for interstitial edema of the optic nerve and papillitis without engorgement of the retinal veins, as well as for early or transitory losses of color fields and the occasional presence of central scotomata. Criticism of Naffziger's findings by those who have not the patience to duplicate his work loses all force upon examination of his celloidin casts in the museum of the University of California. They are too delicate to be shipped about the country for exhibition. The repetition of these novel systems of intercommunication in many different brains is satisfactory evidence against the existence of artefacts. Pockets of the subarachnoid cisterna basilaris, embracing the various cranial nerves, are probably responsible for the various manifestations of abducens palsy and trigeminal pain, which are grouped together under the name of Gradenigo's syndrome.

Evidences of disturbed pressure or of infective processes in the subarachnoid space may be considered in order of the cranial nerves: Optic neuritis, later papillitis, is but the ophthalmoscopically visible expression, of a much more extensive process of the optic nerve and its sheath.<sup>11</sup> Ophthalmologists are more or less inclined to call two diopters swelling, a "choked disc". George Swift, brain surgeon and ophthalmologist, points out in an important recent study that no accurate boundary exists between neuritis, venous engorgement of the retina, and choked disc. The ocular findings depend either upon general cerebral edema, or upon local conditions causing obstruction to ophthalmic venous outflow. To quote: "Spinal fluid readings are unrelated to the ocular findings, save thru the medium of the cerebrospinal fluid. Inflammatory lesions increase the amount, without necessarily obstructing the circulation of the cerebrospinal fluid, but probably retard its absorption."<sup>12-28</sup>

Ampulliform swelling of the sheath and accumulation of fluid with interpenetration of the lymph spaces of the optic nerve (Schmidt-Rimpler) is, according to W. R. Parker,<sup>23</sup> directly related to, and may be caused artificially by increased intracranial pressure, a view shared by Ballance.<sup>25</sup> Atrophy, first gray, then white, is the necessary consequence when such pressure-infiltration is long maintained.

There is a relatively favorable prognosis to the choked disc of serous meningitis, tho much depends upon the severity of the inflammatory process. Any type of decompressive manœuvre, whether it be by dural exposure thru the mastoid,<sup>25</sup> or subtemporal decompression, or lumbar puncture, or cisternal puncture, will relieve the dangerous strangulation of the optic nerve. Intracranial pressure is usually high when choked disc exists, but intraocular pressure in circulatory channels is not necessarily high, until the ocular return circulation becomes directly occluded. Lumbar puncture may deceive as to the ocular prognosis, because some degree of hydrocephalus from ventricular stoppage may exist. Von Hippel<sup>15</sup> and Swift<sup>12</sup> both rely upon ventriculographic studies to clear up this point; the latter follows Bingel's<sup>16</sup> spinal air injection, rather than the intracerebral method of Dandy.<sup>17</sup>

Freedom from other symptoms does not relieve us of the necessity for considering increase of intracranial pressure in the etiology of neuritis. It must, however, not be forgotten, that in the presence of severe infective processes, acidosis or nephritis may supervene, producing intracranial edema and increase of pressure, which may readily be blamed upon direct otitic involvement. White<sup>4</sup> recently found normal fundi in 45 per cent of lateral sinus cases with spinal fluid under increased pressure.

#### SENSORY AND MOTOR NERVE CONNECTIONS.

We must revert to the fact that the retina sends its nervous elements back in a direct association path to the cerebral cortex, traversing the optic nerve and tract,<sup>20</sup> for an explanation of its vulnerability to slight alterations in the composition and volume of the

cerebrospinal fluid.<sup>27</sup> Interference with fluid circulation in the basal cisterna, by fibrinous deposits, caused by local inflammation; or by pressure upon the vascular system from abscesses or exudates, may cause varying degrees of toxic nerve edema, and even of atrophy, entirely disproportionate to the

may subsequent neuritic changes assume diagnostic significance. Conversely, the absence of eyeground changes is no indication of the absence of complications; while their presence may be noted early as one of the first and only observable signs. Uhthoff emphasizes the need for caution in dis-

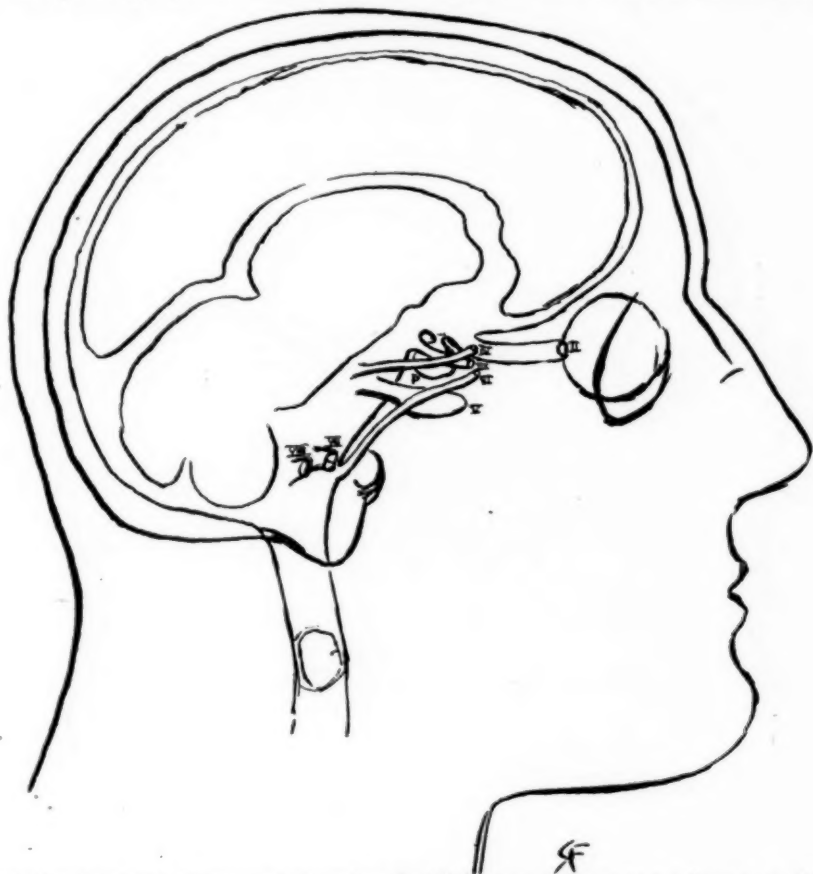


Fig. 2. (After Naffziger) Diagram of the subarachnoid cisternae, with special reference to the cranial nerve pockets.

extent and duration of the brain lesion.<sup>12-28</sup> Since optic atrophy is relatively uncommon after otitic neuritis, it is unlikely that such cases will often call for relief by resection of the upper wall of the optic foramen, as executed by a colleague of van der Hoeve<sup>29</sup> with success, in neurofibromatosis.

Greeff<sup>24</sup> now considers papillary changes extremely frequent in all types of intracranial complications. But Schwartz, Graefe, Bunge, Braunschweig and Brieger long ago pointed out, that only after the optic nerve has previously been observed as normal

tinguishing nerve reddening due to refractive error from true neuritic changes.<sup>20</sup> Koerner<sup>5</sup> reminds us of the frequency of eyeground symptoms, following extensive operative procedures, commonly without permanent consequences.

Out of 23 cases of intracranial complications reported by Schwartz (1892) 11 had neuritis, 1 choked disc. Of 97 cases cited by Hansen (1901) 45 had eyeground changes as follows: 23.7% optic neuritis; 3.1% choked disc; 19.6% vascular changes in the papilla. Bezold (1901) reported more



or less nerve involvement in 23 of 100 acute mastoids demanding operation; and 10% of 60 chronic suppurative cases with cholesteatoma showed optic neuritis.<sup>19</sup> Gradenigo<sup>21</sup> reported papillitis in 52% of 172 cases with intracranial complications.

Considering now the motor eye

ptosis and mydriasis. Lyman's case<sup>24</sup> included also loss of the superior rectus, with fifth and seventh palsies.

Crossed palsies involving the third nerve are rare possibilities, with ear complications at the petrous tip or in the temporosphenoidal lobe.<sup>22-24</sup> The syndrome of Weber (crossed facial

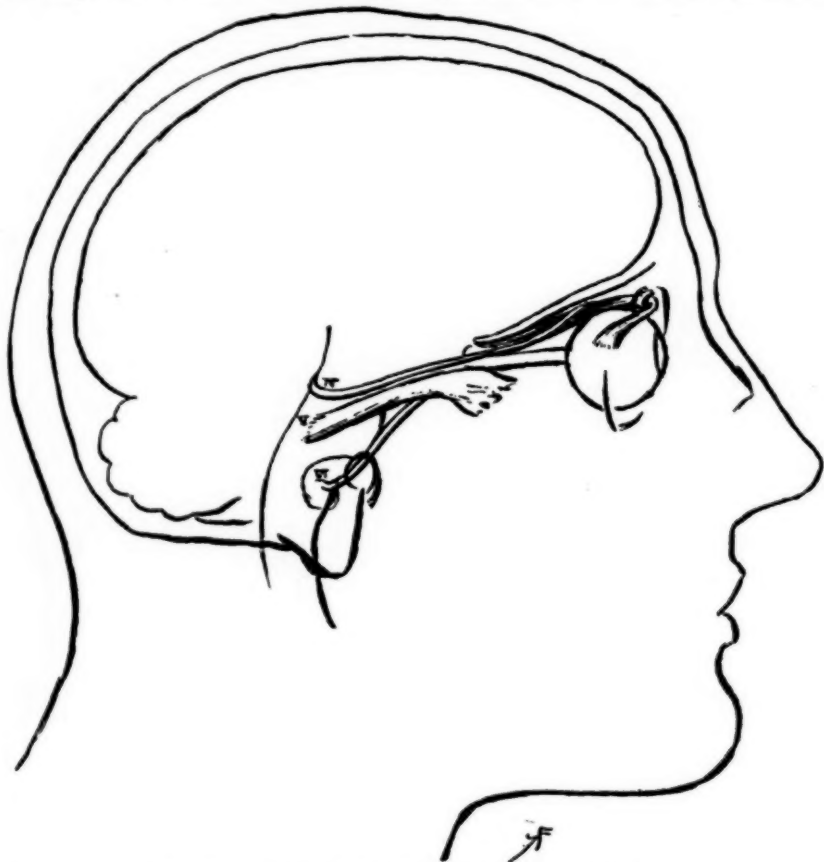


Fig. 3. Relations of the IV, V, and VI nerves trunks.

nerves, we find that oculomotor involvement is unusual because of its high origin and protracted course. Direct injury will only occur upon the most extensive and complicated involvement of the petrous tip and the cavernous sinus. Indirect nuclear injury, due to pressure, is rare and transitory; but when seen is usually due to pressure forward from central cerebellar abscess, or inward from temporosphenoidal abscess, toward the corpora quadrigemina, or against the carotid artery.<sup>2-31-33-35-50</sup> Such involvement usually affects only the levator palpebrae and the pupillary fibers—

and hemiplegia, with ptosis of the same side) is due to a peduncular lesion, just above the pons at the exit of the third pair, and the ptosis may be bilateral. Occasionally temporosphenoidal abscess will cause lateral pressure sufficient to bring about partial third palsy with crossed hemiplegia,<sup>35</sup> with or without other internal capsule associations.

Fourth nerve paralysis is rare with ear complications, since the trochlear is protected by its course under the firm free edge of the tentorium, as it runs forward above the semilunar ganglion and enters the orbit external

to the optic nerve. (Fig. 3.) Circumscribed leptomeningitis with upward pressure is probably to blame for such unusual cases as de Lapersonne's.<sup>21-25</sup>

Fifth nerve involvement may be heralded by a deep seated parietal-frontal ache, occasionally by lancinating pain in the cheek or lower jaw.

of the eye to occur as an ear complication—9% according to de Lapersonne,<sup>22</sup> 8% according to Uhthoff.<sup>2</sup> Its long upward course from the sulcus between pons and medulla, internal to the facial and acoustic roots and up over the petrous tip, is more exposed than that of any other cranial nerve.

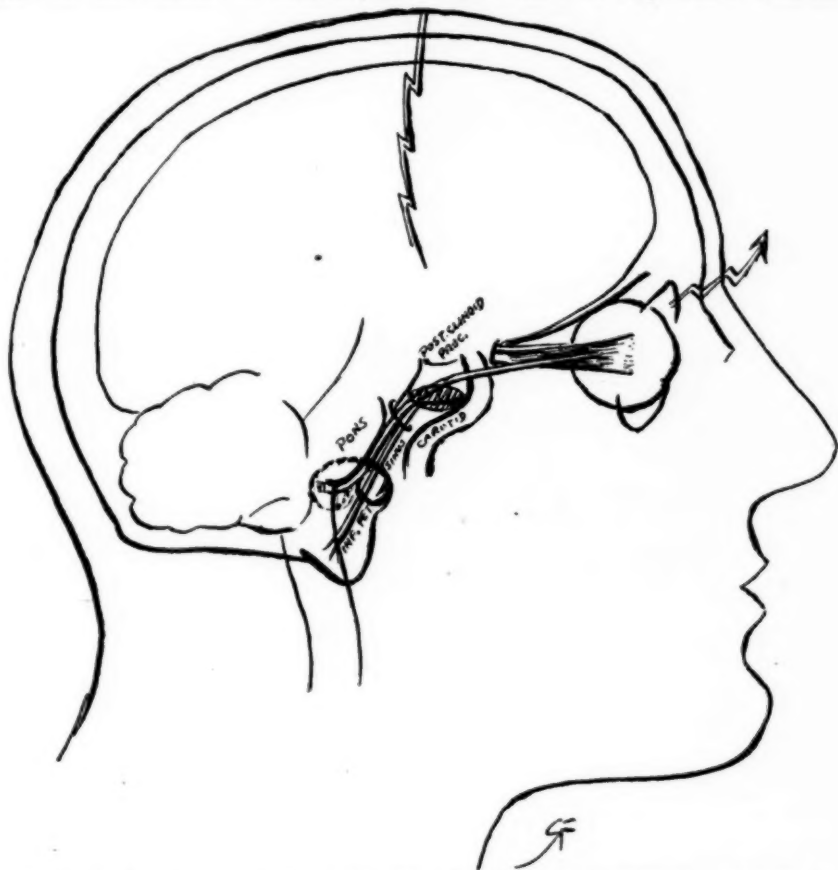


Fig. 4. Relations of the VI nerve trunk; causal factors in the Gradenigo syndrome. (Dorrello's canal is indicated by a bracket posterior to the shaded area showing the semilunar ganglion.)

Lacrimation, corneal insensitiveness, keratitis, herpes of lids or cornea, and ulcer, may terminate in most serious involvement of the globe itself, symblepharon, hypopyon, pannus, phthisis bulbi or panophthalmitis.<sup>30</sup> Invasion of the cavum Meckelii may occur either by extension of localized leptomeningitis into the subarachnoid pocket about the semilunar ganglion<sup>10</sup> from the petrous tip,<sup>6-30</sup> or by purulent extension from petrous cells along the carotid canal.<sup>6-36-37-37</sup>

Sixth nerve involvement is by far the most frequent motor disturbance

(Fig. 4.) Passing steeply over the petrous tip into the narrow fibro-osseous canal of Dorello, the sixth nerve lies internal to the inferior petrosal sinus. Thrombosis of this sinus in retrograde from the jugular bulb may irritate the sixth nerve, as may also the presence of localized subarachnoid exudates arising from deeply placed cells in the petrous tip. Higher up, the abducens lies closely below the carotid artery in the cavernous sinus, while the other ocular nerves occupy the outer wall. Entering the superior

orbital fissure, the abducens is lowest of all.

These relations explain the syndrome of Gradenigo<sup>38</sup>—abducens paralysis and deep parietal pain, accompanying a suppurative otitis. Occasional anomalous cases, of double or contralateral abducens palsy, may be explained by the existence of communications across the base, between the divisions of the subarachnoid cisterna basalis. The pain is due to pressure upon, or invasion of the neighboring

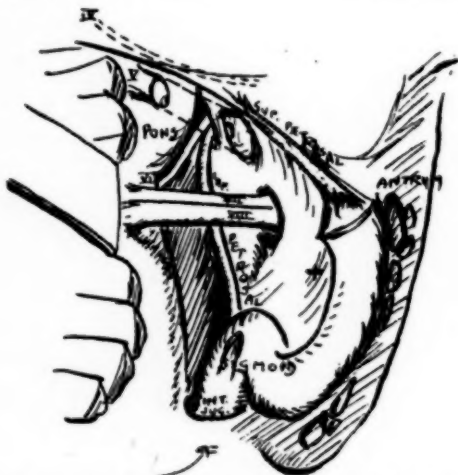


Fig. 5. The cerebellopontile angle, right side viewed from behind, after retraction of the cerebellum. The V nerve root is cut away to show Dorello's canal; the IV nerve is dotted in above the tentorium, + indicates a frequent path for purulent invasion from the mastoid.

subarachnoid pocket of the Gasserian (semilunar) ganglion.<sup>10-26-39-56</sup>

This syndrome was ascribed by Gradenigo to ascending infection via the peritubal cells and the carotid canal; by Forselles,<sup>31</sup> Dench,<sup>40</sup> Shambaugh, Stickney and Day, to circumscribed meningitis at the petrous tip. Dorello's canal<sup>41</sup> and the Gradenigo syndrome have received painstaking study from Perkins,<sup>38</sup> Wheeler,<sup>42</sup> H. H. Vail<sup>43</sup> and W. H. Sears.<sup>44</sup>

Abducens palsies of otitic origin are in general noted, thru complaint of diplopia by the patient, four to six weeks after the onset of acute ear symptoms, and they may terminate by spontaneous recovery in eight to twelve weeks more. Early incidence of this symptom is as infrequent, as speedy recovery when once it has become established. Other eye findings,

including nystagmus, are commonly absent.

Abducens palsy has been reported after spinal puncture,<sup>18</sup> perhaps due to stretching of the nerve in its long course up the basilar process, by dropping downward of the brain.

Examination of the cerebellopontile angle from outward and behind (Fig. 5), with the cerebellum retracted to permit inspection of the posterior petrous surface, demonstrates the juxtaposition of the structures concerned in Gradenigo's syndrome, and also the ease with which cerebellar pressure symptoms may arise.

Nystagmus of spontaneous origin, even if its character and direction change during the course of a case, is not necessarily indicative of intracranial complication; merely of some interference with the transmission of stimuli from the vestibular apparatus, whether peripheral or nuclear. But if an existing nystagmus diminishes or disappears, while the opposite eye begins to exhibit nystagmic irritation, or paradoxical or perverted responses, displacement of the cranial contents by inflammatory exudates should be considered. Nystagmus may be abolished as to one component by paralysis or nuclear inhibition as complications supervene<sup>45</sup> and produce local pressure elevations.<sup>54</sup>

It is suggested by Ingham and Jones<sup>46</sup> that the cerebral projection pathway for voluntary ocular movement derives from the pyramidal tract, altho histologic connections have not so far been shown. There is a bilateral cortical representation for all ocular movements; hence such movements are not lost in hemiplegias of cortical origin. Between the peripheral or neuromuscular connections and the cerebral projection pathway, there exists a coordinating mechanism which receives labyrinthine impulses and produces reflex eye responses; and this mechanism is probably located in the brain stem.

Perverted nystagmus is probably one of the best signs of brain stem involvement; the slow (dragback) component comes up from the brain stem, while the quick component is



cerebral.<sup>47</sup> With total deafness and absence of vestibular responses on the affected side, and loss of vertical responses from the good side, invasion of the cerebellar fossa with sidewise shoving of the brain stem is to be feared.

Conjugate deviation usually accom-

near the internal auditory meatus, in the posterior fossa, the usual peripheral lagophthalmos may be accompanied by lateral paralysis of the soft palate.<sup>33</sup> This may be accompanied by diminished corneal sensitiveness and facial hyperesthesia from forward pressure against the fifth roots.<sup>39</sup>

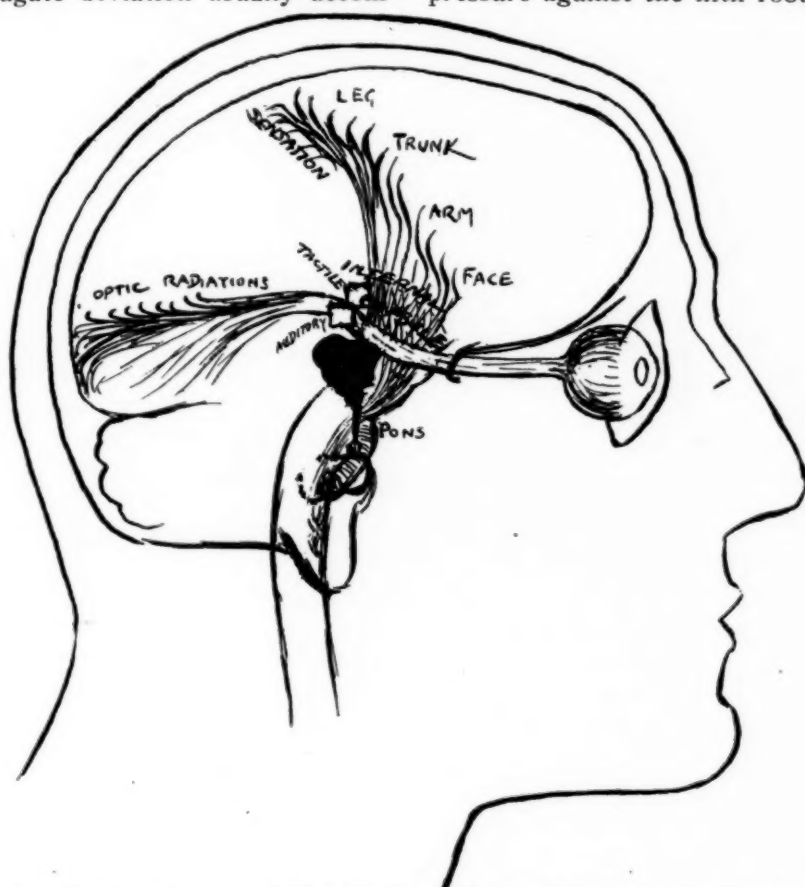


Fig. 6. Diagrams of the lesions conditioned by temporosphenoidal abscess pressure, from the posterior fibers of the internal capsule and the optic tract.

panies acute cerebral irritation. Cerebellar abscess may present a sudden lateral deviation, due to an irritative "sustained tonicity". Any lateral deviation occurring in the course of an otitis should suggest posterior fossa involvement.<sup>48</sup> It must not be forgotten that compensation takes place rapidly in disturbance of the vestibular pathways—like the adjustment of voyagers to the motion of a ship—so that irregularities and discrepancies in nystagmus must be watched for carefully, testing with minimal stimuli.<sup>49-50</sup>

Should the seventh nerve be affected

Temperosphenoidal abscesses are in general nearer the convexity of the brain than the internal capsule, and have therefore no localizing symptoms recognizable in the eye. Pressure from such abscesses leads to optic neuritis, generally bilateral.<sup>1</sup> Slow development and encapsulation of such abscesses favors compensatory circulatory changes; hence a high degree of increased brain bulk may never show true choked disc. Early choked disc is more suggestive of tumor, of chronic hydrocephalus internus, or of

sidewise cerebellar displacement by inflammatory processes.<sup>12-28</sup>

Temperosphenoidal abscess adjacent to the internal capsule gives rise to an interesting syndrome thru involvement of the cuneopulvinar tract of Meyer, running back from the geniculate bodies to the visual centers in the cortex of the cuneus. (Fig. 6.) This pressure, between the lateral wall of the posterior horn of the lateral ventricle and the abscess, may be transitory and only affect the color field,<sup>51</sup> or may persist for years after the cure of the abscess.<sup>52</sup> We have, then, hemianopsia of the same side; deafness of the opposite ear; paresthesia or anesthesia of the opposite side; and occasional motor paralyses of the opposite leg and arm. Rarely, middle fossa pressure gives associated pain in the ophthalmic division of the fifth, and sometimes opposite facial palsy with drooping lid.

Direct damage by an abscess to the posterior part of the second and third temporal convolutions, will cause visual aphasia (Pick), if the abscess be on the left side in a righthanded person, and vice versa.<sup>53</sup>

#### SYMPATHETIC NERVOUS SYSTEM.

The sympathetic nervous system includes connections between ear and eye thru four cranial ganglia—ophthalmic, sphenopalatine, otic and submaxillary; and the superior cervical. Two branches ascend from the latter, one internal, the other external to the carotid in its canal. The outer branch forms the carotid plexus, which connects with the tympanic branch of the glossopharyngeal; with the abducens; with the semilunar (Gasserian) ganglion; and thru the vidian nerve with the sphenopalatine ganglion, by junction with the petrosal branch of the facial nerve. The inner branch of the superior cervical ganglion runs up the carotid canal, to form the cavernous plexus.

Irritation of these sympathetic connections, whether in the external meatus (as by pressure, edema, or fistulization from the mastoid), or by cells along the carotid canal, or at the petrous tip, will cause dilation of the pupil. In addition, stimulation of Müller's muscle may cause slight exoph-

thalmos. By reason of vasomotor inhibition, circulation in the conjunctiva, iris and choroid may show appreciable diminution over that of the normal side.<sup>53</sup>

#### GROUPING OF EYE SYMPTOMS.

Otogenic eye symptoms, which we have heretofore considered from the standpoint of etiology, we shall now briefly group as they may appear to the ophthalmologist.

Edema of the lids and adjacent forehead and cheek; localized cyanosis; congestion of the ciliary veins; all these point to cavernous sinus thrombosis; which may, of course, later entail serious chemosis, exophthalmos, and various motor disturbances.

Inflammatory edema and orbital cellulitis are more suggestive of direct invasion via petrous tip cells; pain and trismus will suggest synchronous invasion of the cavum Meckelii, with irritation of the under surface of the semilunar (Gasserian) ganglion.

Lagophthalmos from facial palsy, without palatal involvement and often with taste disturbance, is peripheral to the knee of the nerve. If intracranial (at the internal auditory meatus) palatal involvement of the same side may be noted. If opposite to the affected ear, especially with opposite deafness and homolateral hemianopsia, opposite sensory and motor losses should be watched for; envisaging the possibility of a temporal abscess, invading or infiltrating the posterior part of the internal capsule.

Loss of sensation in conjunctiva and cornea again points to petrous tip involvement of the Gasserian ganglion; its complications, owing to the active ear condition, will be rather serious, unless active protective measures are initiated. Diffuse keratitis, pannus, herpes zoster, ulcer, symblepharon, hypopyon, may lead on to panophthalmitis, or phthisis bulbi in such cases.

Transitory diplopia must be inquired for and distinguished from vertigo. Ophthalmoplegia is infrequent and partial with the third nerve, affecting the levator and pupillary fibers especially. Abscess pressure toward the corpora quadrigemina, or carotid artery, is generally to blame. With the fourth nerve, also, paralysis is rare and

often transitory, and due to abscess pressure.

With the sixth nerve, paralysis is likely to occur after four to six weeks, and (especially if accompanied by deep temporoparietal pain) points to serous meningitis, or purulent exudate at the petrous tip. If bilateral or contralateral, crossed invasion of the basal cisterna is to be feared. Spontaneous improvement is not infrequent.

Spontaneous aural nystagmus should be observed in all head positions, and distinguished from visual nystagmus. Differences between the nystagmus observed in the two eyes, whether spontaneous or induced, should incline the observer to consider invasion of the posterior fossa. Deafness and lost nystagmic response on the affected side, with vertical loss on the opposite side, should suggest sideways shoving of the brain stem and peduncles, by a cerebellopontile angle process.

Episcleritic nodules, iritis, or chorioiditis with abscess formation, may result from septic emboli from sinus thrombosis.

Inequality of the pupils is immediately suggestive of intracranial involvement; but as anisocoria may have existed prior to the onset of the ear condition, changes in its extent should be watched for.

Mydriasis may be due either to irritation of the superior cervical sympathetic, from petrous cells near the carotid canal, in which case slight exophthalmos might be seen; or to nuclear pressure inhibition of the oculomotor. This latter may result from upward pressure from a rather central cerebellar abscess, or from lateral compression along the course of the nerve by temporosphenoidal abscess.

Miosis is a rare possibility with destructive lesions of the superior cervical sympathetic.

Hippus is suggestive only of basal ganglionic irritation and has no localizing value.

Observations of the optic disc should be made and recorded, for both sides, very early in all mastoid cases. Owing to physiologic and refractive variations, slight reddening of the disc margins should not be recorded as pathologic, unless observed as a change during the course of the disease. It should be remembered, that many extensive ear complications do not show nervehead changes at all; but as well that changes may be transitory, unilateral, or bilateral. There is no accurate boundary between neuritis, venous engorgement of the retina, and choked disc.

Slight degrees of redness may occur with any complication which increases pressure. In order of frequency, we find: lateral sinus thrombosis; cerebellar abscess; temporosphenoidal abscess; serous meningitis; and extradural abscess. It must not be forgotten that extensive choking may occur following jugular ligation. Filling of retinal veins may be watched, while the sound jugular is compressed, if thrombosis has closed the other one.

Visual field changes are those characteristic of the varying degrees of optic neuritis—peripheral contraction of the form field, transitory relative scotomata and color scotomata. General amblyopia and amaurosis do not supervene until late, when long standing edema has brought the beginning of atrophy. Homonymous hemianopsia with crossed motor, sensory and auditory losses is due to internal capsule lesions from temporosphenoidal abscess.

Visual aphasia (alexia) is a rare concomitant of temporosphenoidal lobe infiltration of the side opposite to the used hand.

Ophthalmologists and otologists of the present should be mindful that Albutt in 1863, C. J. Kipp of Newark in 1874, and Zaufal in 1881 emphasized the value of early and frequent ophthalmologic examinations in complicated cases of otitis media.<sup>10</sup>

*Medical Arts Bldg.*

#### REFERENCES.

1. Eversbusch. Graefe-Saemisch, Hdbch. f. ges. Augenh., 1903, vol. IX, part 4, p. 127.
2. Uhthoff. G.-S. Hdbch. (bibliography), 1915, vol. XI, part 2, p. 716.
3. Uhthoff. Idem, p. 722.
4. White, Leon E. Papilledema of Otitic Origin, Trans. Sec. Lar. Ot. Rh. A. M. A. 1925.
5. Eversbusch. Loc. cit. (bibl.), p. 124.
6. Eversbusch. Loc. cit., p. 108.



7. Eversbusch. Loc. cit., pp. 114-115.
8. v. Hippel. G.-S. Hdbch. (bibl.), 1923, vol. VII, part 10, p. 6.
9. Key and Retzius. Anatomie des Nervensystems, Stockholm, 1875.
10. Naffziger. The Cerebral Subarachnoid System, Arch. Neurol. and Psych., 1924, vol. XII, pp. 411-418.
11. v. Hippel. Loc. cit., p. 204.
12. Swift, Geo. W. The Cerebroventricular Study, Northwest Med., 1924, vol. XXIII, pp. 452-459.
13. v. Hippel. Loc. cit., p. 113.
14. v. Hippel. Loc. cit., p. 125.
15. v. Hippel. Loc. cit., p. 160.
16. Bingel, A. Zur Technik der intralumbalen Lufteinblasung, Deutch. med. Wochensch., 1921, vol. XLVII, p. 1492.
17. Dandy, W. E. Ventriculography, Ann. Surg., 1918, vol. LXVIII, p. 5.
18. Eversbusch. Loc. cit., p. 131.
19. Eversbusch. Loc. cit., pp. 117-118.
20. Uhthoff. Loc. cit., p. 812.
21. Wilbrand and Snger. Neurologie des Auges, vol. IV, pp. 512-630.
22. Ruttin, E. Stauungspapille nach Jugularisunterbindung, Int. Zentralbl. f. Ohr., 1919, vol. XI, p. 30.
23. Parker, W. R. Cited by de Schweinitz, Diseases of the Eye, 1924, 10th ed., p. 554.
24. Greeff, R. In Axenfeld, Augenheilkunde, Jena, 1920, p. 677.
25. Ballance, C. R. Observations on the Temporal Bone, 1919, vol. II, p. 406.
26. Gradle, H. S. Development of the Eye, American Encyc. Ophth., vol. V, pp. 3862-3920.
27. Wegforth and Weed. Analogous Processes of the Cerebral and Ocular Fluids, J. Med. Res., 1914, vol. XXVI, pp. 167-170.
28. Eagleton. Brain Abscess (bibl.), 1922, pp. 169-172.
29. van der Hoeve, J. Leiden, Private Communication, 1925.
30. Uhthoff. Loc. cit., p. 816.
31. Wilbrand and Snger. Loc. cit., vol. VIII, p. 262.
32. de Lapersonne and Cantonnet. Neurologie Oculaire, 1923, p. 297.
33. Eversbusch. Loc. cit., p. 133.
34. Terrien and Cousin. L'Oeil en Medecine Generale, 1924, pp. 87-88.
35. Parsons, J. H. Diseases of the Eye, 1923, p. 548.
36. Lyman, H. W. Postoperative Palsies of III, V, and VII, Ann. O. R. L., 1925, vol. XXXIV, p. 265.
37. Auriti. Paralisi delle V, VI, irrit. simpatica., Univ. Rome, Atti di Clin. O. R. L., 1920.
38. Gradenigo. Paral. des N. Abducens bei Otitis, Arch. f. Ohrenh., 1907, vol. LXXIV, p. 149.
39. Eagleton. Loc. cit., pp. 201-203.
40. Dench. Mastoiditis with Unusual Symptoms of Intracranial Involvement, Ann. O. L. R., 1916, vol. XXV, pp. 672-675.
41. Dorello. Att. di Reg. 1st Anat. Roma, cited Monatsch. f. Ohrenh., 1912, vol. XLVI, p. 332.
42. Wheeler, John M. Paral. of VI, Cranial Nerve Assoc. with Otitis Media, Tr. Sec. Ophth., J. A. M. A., 1918, vol. LXXI, pp. 1718-1722.
43. Vail, H. H. Dorello's Canal, Laryngoscope, 1922, vol. XXXII, p. 569.
44. Sears, W. H. Gradenigo's Syndrome, Tr. Am. Acad. O. O., 1924, p. 264.
45. Brny, R. Kortikale Hemmung des Nystagmus bei Augenmuskellhmungen, Acta Otol., 1922, vol. IV, p. 66.
46. Ingham and Jones. Certain Neurootologic Problems, Ann. O. R. L., 1924, vol. XXXIV, p. 297.
47. Wilbrand and Snger. Neurologie des Auges, vol. VIII, p. 308.
48. Eagleton. Loc. cit., pp. 195-197.
49. Macfarlan, D. Vestibular Accommodation, Ann. O. R. L., 1924, vol. XXXIV, p. 160.
50. Eagleton. Loc. cit., p. 167.
51. Eagleton. Loc. cit., p. 180.
52. Brunner. Lhmung mehreren Hirnnerven, infolge Panotitis usw., Monatsch. f. Ohrenh., 1920, vol. LIV, pp. 682-684.
53. Haskin, W. H. Ocular Manifestations Indicating Sympath. Involvement in Aural Disease, Tr. Am. Otol. Soc., 1913-15, vol. XIII, p. 144.
54. Fisher, Lewis. Present Status of Vestibular Tests in Intracranial Conditions, Tr. Am. Otol. Soc., 1925.
55. Lillie, H. I. Choking of Optic Discs in Surgical Mastoid Disease Without Intradural Extension, Tr. Am. Otol. Soc., 1925.
56. Engelhardt. Abducens Paral. in Extradural Abscess at Petrous Tip, Ztsch. H. Nas. and Ohr., 1925, vol. XI, p. 194.
57. Smith, Carroll. Abscess of the Gasserian Ganglion Complicating Mastoidectomy, Ann. O. R. L., 1925, vol. XXXIV, p. 938.
58. Perkins, Chas. E. Abducens Paralysis and Otitis Media Purulenta (bibl.), Ann. O. R. L., 1910, vol. XIX, p. 692.

## TRACHOMA.

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This is a summary of views now held regarding trachoma by leading ophthalmologists. A discussion of its diagnosis is given. The treatment the writer has found most satisfactory is described in relation to various stages of the disease. Lecture before Section on Instruction, American Academy of Ophthalmology and Oto-Laryngology, October 24, 1925.

It is not my intention to attempt to settle any phase of the trachoma problem, for problem it is. I will merely give an expression of some of the trachoma experts with excerpts of the recent literature, embellished with personal experiences and observations, and the presentation of slides emphasizing the differential diagnosis.

Considering the age of the disease, as Boldt has said, "as old as the Nile itself", it would seem that it must be incurable. However, it is curable at least in a sense. The American Medical Association Committee on trachoma in 1921 says,<sup>1</sup> "strictly speaking trachoma can not be cured tho it may be arrested." Dr. John McMullen, Surgeon U. S. Public Health Service,<sup>2</sup> who has had vast experience in trachoma, says, "with the proper surgical procedure followed by the after care and treatment, any case of trachoma can be cured, the length of time required depending upon its duration, severity and other factors."

Needless to say extended efforts are being made to determine its etiology, much discussion as to the diagnosis and volumes written on its treatment. Trachoma is an inflammatory disease principally of the palpebral conjunctiva and tarsus, characterized in its worst form by great hyperplasia followed by atrophy, resulting in more or less lid deformity with corneal complications. It is widespread, endemic in many countries. Some high altitudes seem to be exempt, notably Switzerland, while it is extremely prevalent in the mountains of Kentucky and West Virginia. No one knows why. It occurs in all races, the Egyptians being very susceptible, 80 to 90 per cent estimated infected, while in the pure blood negro it is very rare.

Is it on the increase in the United States? Again, no one knows. Statistics mean nothing, because no systematic examinations are being made

and in only part of the states is it reportable. Again the question of diagnosis has not been settled. There is much controversial discussion carried on as to the differentiation between trachoma and folliculosis.

Some progress has been made, more particularly as to treatment, and the veriest tyro knows the value and method of its prophylaxis. However, it would seem that a more definite, widespread plan should be evolved for its prevention, otherwise it will always be with us. The types of trachoma are papillary and granular. However, according to Fuchs,<sup>3</sup> the so-called trachoma mixtum is most frequent and proven microscopically to be almost the only form.

### ETIOLOGY.

Stucky<sup>4</sup> in 1921 summed up the situation in these words, "As I stated ten years ago I repeat today, I am not certain whether it is of bacteriologic origin, whether it is a fly borne, insect borne, house disease, or whether it is due to a specific microorganism, but I am convinced that it is not as actively infectious as I thought then."

The report of the Committee on Trachoma of the American Medical Association<sup>5</sup> in 1921, summarizing says: "The true cause, or specific causative agent of trachoma, has not yet been positively determined. The disease is conveyed to a healthy eye from a diseased eye by means of the morbid secretions. The secretions therefore, contain the cause; but whether this is an organism or merely an organic substance we do not know with certainty." This about sums up the situation; and that is, the etiology is unproven.

Dr. Kyoze Majima,<sup>6</sup> under the title "Studien über Prowazeksche Körperchen, besonders die Reinkultur von demselben", reports very recently having found the Prowazek bodies to be

plentiful in the acute stage of trachoma in Japan. He succeeded in making pure cultures on agar food media, at a temperature of 25 to 30° C. They grow very poorly if at all at a temperature of 37° C. Inoculation experiments on rabbits and monkeys have succeeded in producing a conjunctivitis, from the secretion of which the Prowazek bodies were recovered, but no follicles were produced. Dr. Majima is continuing his studies of the Prowazek bodies, particularly the inoculation experiments, the results of which will appear in later publications.

The A. M. A. Committee further says trachoma is not highly contagious. Parsons' says, "trachoma is an extremely contagious disease", and that "bacteriology has failed to elucidate its pathology". Dr. Harold Gifford\* will probably agree perfectly with Parsons, as he reported to this society in 1920 contracting the disease from a droplet alighting in his eye while doing an expression.

Casey Wood\* writes, "the most dangerous epidemics are those characterized by abundance of yellowish discharge, while a trachoma kept in check by systematic treatment possesses slight degree of contagion." The foregoing shows the consensus of opinion as to its contagiousness, the difference being as to its virulence.

At home we started an interesting experiment which the advent of the war interrupted. It was running Wassermans on every case of trachoma. Of the 52 cases on which this experiment was made, 46 were positive. This proves nothing, as in the types of cases upon which it was tried one would expect a large percentage to be positive. It would indicate however, the need for systemic treatment in the complications such as ulcers, iritis, keratitis and pannus. Tuberculous individuals, particularly the so-called scrofulous type, are prone to acquire trachoma. Various bacteria are found, none being pathognomonic by their presence. They are responsible in a large measure for the acute symptoms, particularly where there is much discharge present. Among these may be men-

tioned Koch-Weeks, influenza, Morax-Axenfeld, staphylococcus, and even the gonococcus.

#### SYMPTOMS.

Probably the first are lacrimation, photophobia, pain, and discharge of sufficient intensity to merely glue the lids together. This is quickly followed, as the intensity of the disease increases, with extreme redness and papillary hypertrophy of the conjunctiva; and the appearance of granules, according to the type. Then ptosis, pannus, ulcers, etc., with entropion and trichiasis. With this brief statement I will proceed to the *differential diagnosis* which includes practically all of the symptoms.

There is much contention as to the diagnosis of trachoma; particularly is this true in the early stages. The American Medical Association Committee<sup>10</sup> on trachoma in their summary says, "trachoma follicles can often in no way be certainly and absolutely distinguished from that of simple folliculosis."

J. W. Jervy<sup>11</sup> says, "no one can differentiate between folliculosis and trachoma in individual cases; the follicles in the early stages are absolutely indistinguishable." Granting these statements to be true, then other clinical evidence is necessary to correctly diagnose trachoma from folliculosis.

First: *Folliculosis*. It is essentially a disease of childhood and young adults, occurs in any walk of life, sanitary or insanitary, rich or poor. It is essentially without inflammatory symptoms. The follicles are confined principally to the conjunctiva of the lower lid, never on the bulbar conjunctiva<sup>12</sup>, usually arranged in parallel rows 1 to 2 mm. in size, discrete and raised above surface of the conjunctiva, disappears in time without treatment; with no pannus, corneal ulcers, scar tissue, shrinking of culdesac, or ptosis. Not contagious.

*Trachoma*. Round, opaque, ill defined bodies, grayish white, deeply embedded, diameter may be 5 or 6 mm.<sup>13</sup> Sago grain appearance much more numerous in upper lid, deeply em-



bedded in tarsus, structural changes always present in conjunctiva, papillary hypertrophy upper lid in most cases, pannus and corneal ulcers in 25 to 50 per cent of cases, trichiasis, entropion and shrinking of culdesac frequent. Ptosis in practically 100 per cent of cases; and when not present, apparent, due to excessive fat under skin of upper lid, or relaxation of skin itself. Occurs any age, usually in poor sanitary surroundings, and is actively contagious.

In suspected cases where follicles are pronounced, I make it a practice to express the follicles with a ring forceps, care being taken to produce little traumatism. If the case gets well quickly with no treatment it is folliculosis. The patient is entitled to as early a diagnosis as it is humanly possible to make, as the longer the disease persists the more destruction and the more severe the complications. I have seen very little scarring follow this treatment. In a recent conversation, Dr. John E. Weeks agreed that it was a proper procedure and suggested the follicles be opened with a scarifier before expression. De Schweinitz<sup>14</sup> says, "in stubborn cases expression of the swollen follicles with suitable forceps should be performed." McMullen<sup>15</sup> stresses this point in trachoma, "the blood vessels of the conjunctiva are more or less obscured and it is not possible to trace them uninterruptedly from the ciliary border to the culdesac, which would be possible in the absence of hypertrophy."

*Vernal catarrh*, particularly the palpebral type, Parinaud's conjunctivitis and acute catarrhal conjunctivitis may be mistaken for trachoma. Just recently I had a case of the so-called cobblestone variety of vernal catarrh, which had been treated two years for trachoma. It might be interesting to know that a tarsectomy seems to have cured this case. In vernal catarrh; symptoms, mild conjunctivitis, burning and itching, are worse in Spring and Summer, occurs in young people usually. Met with in all classes, is sporadic and noncontagious. Two types, palpebral and bulbar, sometimes

a combination of the two. Everted lid presents, in typical cases, hypertrophied and mapped out polygonal raised areas, not unlike cobblestones, with surface of milky hue. If questionable, excise a piece and find dense fibrous tissue with many eosinophile leucocytes.<sup>16</sup>

*Acute catarrhal conjunctivitis*. Symptoms disappear early with proper treatment.

*Parinaud's conjunctivitis* usually affects one eye. There are red or yellowish granulations on the tarsal conjunctiva or fornices, swelling in preauricular and submaxillary glands; and it commences with fever and other constitutional disturbance. Finally the circumstances of living, sanitation, presence of other cases in the same family, school or neighborhood, must often be taken into account to establish a correct diagnosis of trachoma.

#### TREATMENT.

This depends on which of three stages, acute, subacute and chronic, the disease has reached.

*Acute stage*. H. W. Woodruff<sup>17</sup> advises 10 per cent silver nitrate, applied to the lid, care being taken to protect the cornea, the excess being neutralized by salt solution. This is followed with 10% dionin. He says, "if seen early before tarsus is involved a few treatments may effect a cure." Silver nitrate in 2 to 4% solutions is the orthodox treatment. It is particularly appropriate when much secretion is present. I invariably commence the treatment with a 2% solution, the only care being necessary is to prevent argyrosis. If this treatment is unavailing, recourse is had to the copper stick, in the event there is not much reaction and no corneal ulcers present.

However, I have used it with good results when those conditions were present. Mercury bichlorid, 1 to 5000 to 1 to 3000, is used by many, as is formalin 1 to 3000. Alum stick has not given much satisfaction in my hands. Pull off granulations as soon as sago grain appearance identifies the disease. As I said before, it is sometimes justifiable even tho a positive diagnosis has not

been made. Knapp's roller forceps, or ring forceps, are universally used for expression, the latter being preferable to the writer. During the acute stage of swelling often an external canthotomy is of great value, relieving the pressure and exerting a marked influence to relieve the symptoms and shorten its course.

*Subacute stage.* Use mechanical irritants, silver 2 to 4 per cent, corrosive sublimate 1 to 500 massage, powdered boracic acid sprinkled on the conjunctiva and massaged thoroly until bleeding takes place, with gauze wrapped around the finger. This has given us probably as good results as any other treatment in this stage. Grattage is employed by many, Darier, Fox, McMullen and Jacovides of Alexandria, Egypt, the latter having done more than 15,000 cases. As performed by Darier<sup>18</sup> the lid is completely everted and the exposed conjunctiva thoroly scarified with a 3 bladed scalpel; after which it is scrubbed with a tooth brush, which has been steeped in corrosive sublimate solution 1 to 1000 just before being used. Irrigation with milder antiseptics, and no dressings applied. Care should be taken to remove all granulations, particularly in the culdesac, which must be exposed by pressing downward on the lid with an ordinary glove buttoner, with a wire loop (McMullen's method), the patient in the meantime looking downward.

*Chronic stage.* Here is where surgical treatment is indicated and the operation for its cure is tarsectomy. It has as proponents Fox, H. W. Woodruff, Allport, J. Boldt and many others. Fox<sup>19</sup> quotes Boldt who he says is the best informed of all writers on the subject and agrees with him when he states "we cannot here enter into the objections for the most part theoretical, of the numerous opponents of excision. They have long been refuted by those who have tried the method." The operation was discovered accidentally by Heisrath in 1882 and popularized by Kuhnt in the late nineties. It may be done in several ways.

In my hands the easiest and most successful way is this: Good anesthesia is obtained with cocain instillations followed by injections of 2% novocain into skin and conjunctiva. The lid is everted and held firmly with forceps, a spatula supporting it. An incision is then made along the upper margin where the conjunctiva can be freed from the tarsus, the latter being dissected out clearly from all muscular structure. The tarsal incision is then made with scissors between the horizontal scar which corresponds to the sulcus and the lid border. Silk sutures are then placed, tied on the skin surface. Place sutures so there will be as little thread as possible come in contact with cornea; reason, might produce ulceration. (The sutures may be left out and it is my experience if the conjunctiva will lie in place, just as good results are obtained.)

Contraindications to tarsectomy are atrophy of conjunctiva, where a good culdesac can not be maintained, and acute corneal ulcer.

Dr. R. J. Curdy has good results in cicatricial trachoma with return of superficial ulcers and pannus with this formula: Ethylhydrocuprein grs. IV, zinc sulph. gr. I, aqua destil., ounces I. This he uses two or three times daily. The writer often uses in this stage gentle massage with silver nitrate  $\frac{1}{4}$  percent, followed by dionin 10 percent solution.

Complications: In cicatricial entropion, nothing has been devised which can improve the Hotz operation, a classic which has stood the test of time.

Corneal ulcer is many times best relieved with cyanid of mercury subconjunctivally, 1 to 1000, eight drops with four drops of 4 percent cocain. In the severe form of pannus, so called crassus, an infusion of seeds of jequirity is highly recommended, care being used to guard against sloughing. I have used milk injections intramuscularly with gratifying results in ulcer, pannus and the acute exacerbations. However, it has no curative effect on the trachoma but there is certainly great relief from pain and amelioration of acute symptoms.

Stucky lately has emphasized the systemic treatment for trachoma, and in a recent letter says he is regulating the diet and giving his patients large quantities of cod liver oil under the belief that there is lacking Vitamin A in the diet which may have its effect in producing trachoma.

Likewise systemic treatment is indicated in patients whose resistance is

below par from any wasting disease.

Roentgen rays and radium have been and are being used with no startling results so far proven.

Peritomy and peridectomy, while not often indicated, have their place and in some cases good results follow.

Canthoplasty is advisable where permanent widening of fissure is desired.

*Elks Bldg.*

#### BIBLIOGRAPHY.

1. Trachoma Committee. A. M. A., Presession Report, 1921, p. 292.
2. Reprint Public Health Reports, July, 1917, vol. XXXII, No. 28, pp. 1101-1104.
3. Fuchs. Fifth Edition, p. 166.
4. Stucky. Journal Indiana State Medical Assn., Jan. 15, 1922, vol. XV.
5. A. M. A. Trachoma Committee, Presession Vol. Transactions, 1921, p. 291.
6. Kyoza Majima. Nippon Gankagakkai, Zasshi, July, 1925, v. XXIX.
7. Parsons. Diseases of the Eye, 4th ed., p. 169.
8. Gifford. Transactions American Academy Ophthalmology, Oto-Laryngology, 1920, p. 200.
9. Wood, C. American Encyclopedia of Ophthalmology, vol. XVII, p. 12877.
10. American Medical Assn. Committee. Presession Report, 1921.
11. Jervy, J. W. Journal Indiana State Medical Assn., Jan. 15, 1922, vol. XV.
12. Parsons. Diseases of the Eye, 4th ed., p. 167.
13. Parsons. Diseases of the Eye, 4th ed., p. 168.
14. de Schweinitz. 7th ed., p. 283.
15. McMullen. Journal American Medical Assn., Oct. 23, 1920, vol. LXXV, pp. 1109-1112.
16. Parsons. Diseases of the Eye, 4th ed., pp. 177-178.
17. Woodruff.
18. Darier. Ophthalmic Record, Dec., 1912.
19. Fox. Journal Indiana State Medical Assn., Nov. 15, 1925, vol. XVII.

### EDEMATOUS ANTHRAX OF THE FACE RESULTING IN MENINGITIS.

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In this case there was no local skin lesion and an incision of the lid revealed no bacilli. This made the case very obscure. The anthrax bacillus was discovered only after spinal puncture was made. The general features of such infections are reviewed in contrast to the symptoms of the case.

Paul McClay, aged 35 years, a piecer of yarns, presented himself at the Eye Dispensary of the Hospital of the Protestant Episcopal Church with the history of having had a small swelling, thought to be a sty, on the upper lid of the right eye two days before. He had no pain, but consulted his family physician, who prescribed for him on account of the swelling of his face. The swelling increased enormously in spite of the treatment.

When seen at the clinic, there was an intense swelling of both lids of the right eye extending over to near the parotid region. There was no external lesion of any kind to account for the edema, nor could any area of greater

density be localized by sense of touch. A small separation of lids, made forcibly with a retractor, showed the cornea and iris to be normal, but no eversion of the lids was possible, nor was there any bloody discharge from the use of the retractor.

A deep incision in the upper lid, made by my associate, Dr. Brinkerhoff, resulted only in a bloody discharge. The culture made was negative. A hot saturated solution of magnesium sulphate was ordered for continuous application, the patient to return the following day if not relieved. He returned two days later to the clinic of a colleague, Dr. A. G. Fewell, where the patient had a convulsion.

Dr. Fewell, recognizing the seriousness of the affection, admitted the patient into the wards and notified me. When we saw the patient that night, he had a temperature of 102°. The swelling had increased so that the whole of the right face was involved. The swelling was hard, brawny, with a rather sharply defined edge as in erysipelas. The upper lid, at the site of the wound was purplish, the edges of the wound somewhat necrotic. Culture from this wound and from fresh incisions showed a few cocci.

The patient was seen by various members of the staff of the hospital but as the lesions were masked, anthrax was not suspected. The X-ray of the sinuses was negative. The urinary analysis and Wasserman test were negative. The white blood count was 10,800; the blood culture was negative. The neck, chest, abdomen and extremities were negative. The teeth were reported to be in bad condition.

The day following his admission to the house the swelling, while extensive, seemed somewhat less on the right side, but was encroaching the left side over the bridge of the nose. That evening he vomited and later became very restless. He was quieted for a few hours with a morphin injection given by Dr. Spikes. When he awoke, he was delirious. He showed some rigidity of the neck but had no Kernig's sign. The temperature remained at 102°. He became comatose, with Cheyne-Stokes respiration. The neck became spastic, hand and fingers atetoid. Spinal fluid was withdrawn, the examination of which showed a fluid that was very cloudy, with sugar present, a globulin cloud and a cell count that was impossible on account of much coagulated albumin.

The smear of the fluid showed very many pus cells and anthrax bacilli. The growth showed pure culture of anthrax bacilli. Pulmonary edema developed rapidly, the patient dying at 3 a. m., the following morning, within 36 hours of his admission to the hospital.

The autopsy showed a suppurative meningitis, due to anthrax bacilli

which were found both in smear and culture. A culture from the right eye made at the postmortem showed no anthrax bacilli. The postmortem changes consisted of extensive edema and hemorrhages in all of the deeper structures. In the stomach it was in the submucous coat. In the lungs, edema and congestion were present with hemorrhages into their deeper structures. The meninges were congested, with extensive hemorrhages in the subarachnoid space.

In this patient, we had a mysterious swelling of the right side, with no local lesion and no evidences of sinus disease. There was a marked absence of pain. A diagnosis of intense cellulitis of unknown origin had been made. This was amplified just before death when anthrax bacilli were found in the spinal fluid, showing that we had a case of malignant edema. The subject of anthrax is one that does not often come to the attention of ophthalmologists. The case reported will show the rare importance of remembering that anthrax can assume an unusual appearance.

A short review of anthrax infection may not be out of place: Anthrax is a disease caused by a specific organism, the anthrax bacillus, which is a rod shaped, nonmotile organism remarkable for its large size, about 1/3000 inch in length. When growing in living animals, it multiplies by fission and no spores are formed. If, however, the blood or any discharge from an infected animal be exposed to the air, small round spores of remarkable vitality are formed in the bacilli. These spores may survive for several years and remain capable of reproducing the disease in a favorable media. They resist antiseptics but are killed by boiling for 15 or 20 minutes.

The disease essentially is one that attacks cattle, sheep, horses and mice, carnivorous animals being much less susceptible. It is communicated to man usually by contact with living or dead animals or with the hides of the infected animals.

The disease begins usually as a cutaneous lesion known as malignant



pustule. When the respiratory tract is the primary seat of infection, it is known as wool sorter's disease. In Guy's Hospital, of 100 cases reported, only three women were infected, the rest being largely waterside laborers, porters of raw hide (about 58 percent) tanners and leather dressers, 12 percent of the rest being in various occupations. In this series the pustule was situated in the face of 48 patients and on the neck of 41.

Among the symptoms in the ordinary case of malignant pustule is the formation of a pimple or pustule usually thought to be the bite of an insect. The pain, redness and swelling increase so that usually on the third day a physician is sought. The typical lesion then is a pustule  $\frac{1}{4}$  of an inch in diameter, in the center of which is a black slough due to extravasated blood. Surrounding this is a ring of vesicles filled with a clear or semipurulent fluid. Around the vesicle is a red indurated area, beyond which is edema of the skin and subcutaneous tissues.

In some cases the black slough or vesicles are absent and in early cases the redness and edema may not be present. Occasionally there is no definite pustule but a large brawny area with much edema simulating an ordinary cellulitis. This condition is known as anthrax edema. When present, in the neck, there is serious danger of edema of the glottis. Constitutional symptoms vary in severity, but dizziness and headache are usually present. The temperature runs about  $102^{\circ}$  to  $103^{\circ}$ . In fatal cases, a form of septicemia is produced.

Even when there is extensive edema, with thrombosis of the subcutaneous veins, and several constitutional symp-

toms are present, a considerable proportion of patients recover under active treatment. This should consist in excising the pustule, the incision extending to the deep fascia. The raw surface is then treated with pure carbolic acid, sulphur emulsion or actual cautery. The wound is allowed to granulate. If there is much edema, a 20 percent carbolic solution is injected about the excised area. Anthrax serum is found to be of much value, but early excision should always be the primary treatment. Finally, meningitis is not a common feature in this disease. In our case it directly gave us our diagnosis, as before the spinal puncture, due to the development of cerebral symptoms, we knew no causative factor.

F. Herzog (Beit. z. path. Anat. u. z. allg. Path. v. LX) quotes 3 cases in which there was a hemorrhagic leptomeningitis, with extensive hemorrhage in the subarachnoid and pial layers of the brain, due to degeneration or solution of the arterial wall, the outer layers of which seem to be particularly susceptible to the anthrax poison. Even in the lymphatic structures of the neck, similar hemorrhages were found which destroyed the parenchyma of the gland.

Herzog quotes a number of German authors in his bibliography who have reported meningoencephalitis in fatal anthrax which in every case was of a hemorrhagic type. The blood vessels were always widely dilated, with extensive exudates of red blood cells, large numbers of lymphocytes, much altered by the intensity of the pathologic irritation. Some of these cells contained large vacuoles and were not apparently zytophagic in function.

1703 Chestnut St.

## PAPILLITIS, HEADACHE AND MENTAL DEPRESSION FROM OSTEOMA OF SEPTUM.

OTIS WOLFE, M.D.

MARSHALLTOWN, IOWA.

A man kicked by a horse suffered headaches and blurred vision which had gradually become more severe for thirteen years. Operation on the occipital region was decided on. But a deflected, thickened, bony, septum was first corrected and this gave relief from all his symptoms.

Three years ago Mr. S., age 48, farmer, was referred to us by a highly competent general surgeon whom he had consulted for relief from his unusually severe headaches and mental depression. He gave a history of having his nose broken when seven years old and also having been kicked in the back of the head by a horse 13 years ago. His headaches dated from this. They had gradually become more severe. They seemed to start in the occipital region and then involve the entire head.

He was never entirely free from headache and pressure in his head, but at times had attacks lasting two or three weeks. The last two years these attacks were becoming so severe that he was completely incapacitated; pain most severe between 10 a. m. and 2 p. m.,—"sunpain". He had been taking massive doses of headache medicine and of late his family physician had resorted to opiates to quiet him.

He was referred to us especially because of a feeling of pressure back of the right eyeball and a blurring of vision in this eye, which he said was very bad at times.

At this time he was in Mercy hospital under observation, and suffering with an acute attack. The Sister Supervisor was afraid of him and felt that he was developing acute mania. Opiates were necessary to quiet him. The X-ray revealed a fracture of the inner plate of the skull in the occipital region, approximately where he had been kicked. The surgeon was contemplating operative measures on the skull to relieve the intracranial pressure. The urine, blood and Wasserman, and all other examinations were negative. Our examination showed: Vision = R, 20/30 + 3; L, 20/20.

Right eye not improved by refraction. (He stated that during some of the attacks his vision was much poorer in this eye.) The right disc margin

was "fuzzy" and slightly edematous, with engorgement of the veins. Perimeter findings suggestive of scotoma, with slight enlargement of the blind spot; with the campimeter a small, but positive, central scotoma was outlined for red and blue.

Nasal examination showed only slight obstruction to breathing. The septum was deviated to the right, sharply so in the middle turbinate region. There was a large compensatory enlargement of the left middle turbinate. The septum did not shrink much with adrenalin and cocain, and a cotton tipped probe could not be passed between the right middle turbinate and the bulge of the septum. The X-ray revealed a very thick bony septum. (Fig. 1.) It was then elicited that his symptoms were precipitated and exaggerated if he caught the least cold in his head. This is a very important point when considering nasal cases.

The surgeon was advised of the finding, and our opinion given that a part, if not most, of his symptoms were coming from nasal pressure, and operation was advised. The surgeon asked if we felt justified in operating his nose first, in face of his extreme nervous irritability and melancholia. Feeling that we were justified in taking the chance, he advised us to proceed, saying he would defer his surgery on the occipital region until after we had performed ours.

We operated him with considerable difficulty, under local anesthesia. A submucous resection was performed. The cartilaginous septum was wholly bony but not unusually thickened. Bending sharply to the right, and extending out from the sphenoid rostrum, the posterior septum was solid bone and varied from five to seven mm. in thickness. It was tightly wedged up against the R. M. turbinate.

It was necessary to chisel it out. The sphenoid was exposed. It was large, but no pus or necrosis found here or elsewhere in the nose.

A few hours after leaving the operating room he stated that the "pressure feeling" felt relieved already. The next day he had very little headache and the change in his mental condition

who was much pleased, tho frankly surprised at the result obtained. As the inferior meatus was unobstructed, allowing good breathing space, attention was not directed to the nose.

Papillitis is used to describe this condition, altho "papilledema" as differentiated by Holden would be preferable. Fuchs does not differentiate



Fig. 1. Osteoma of upper part of nasal septum causing severe pressure symptoms but little obstruction to breathing.

was very noticeable. From the third day on he had absolutely no headache, and has had none since. His family and physician state that he is a different person altogether, and that his mental condition has completely cleared up. A few months afterward he came in to see me to express his thanks, telling me that he felt like he had a different head. His vision was 20/20, both eyes, and the discs were normal. No scotoma.

The intended surgery on the occiput was never necessary; much to the gratification of my surgeon colleague,

them. We have had several cases in which papilledema, muscle imbalance and mental depression were traced to intranasal pressure, with little or no infection present at the time, but usually giving a history that would suggest its having been previously present, as discussed by the author in the *Iowa Medical Journal*, Sept. 1922.

Obscure eye symptoms, sunpain, and headaches should call for critical consideration of the posterior nose, even tho no pus is present. If the patient's symptoms are exaggerated by catching cold, it is very significant.

## IRIDECTOMY WITH WINGED INCISION (LUEDE) IN GLAUCOMA.

JOHN GREEN, M.D.

ST. LOUIS, MO.

The classes of operations done for glaucoma are here outlined, with the features that the operation of choice should possess. The writer feels that the winged iridectomy of Luedde most nearly fulfills the indications, and describes his technic. Nine cases are given illustrating results obtained in different forms of glaucoma compared in some with other operations done on the fellow eye. Read before the St. Louis Ophthalmic Society, April 24, 1925.

The glaucomatous state is made up of a number of factors of which one is hardness of the globe. Whatever of perverted ocular function is due to increased pressure should be favorably influenced by a reduction in pressure. As a matter of everyday clinical observation, we see glaucomatous eyes manifesting their gratitude at the relief of the burden of hypertension by increase of vision and expansion of the visual field. But it is not always so. For reasons as yet unknown, a minority of such eyes, softened by miotics or operation, continue on the downward path until blindness supervenes.

Operation in glaucoma has a single immediate aim: the lowering of intraocular hypertension. Three principal methods have been proposed:

- (1.) Iridectomy—to promote free access of aqueous to the Canal of Schlemm.
- (2.) Formation of a channel from the anterior chamber to the subconjunctival space.
- (3.) Drainage of the aqueous to the suprachoroidal space.

Modifications of these methods have been suggested in the hope of adding some feature of value to the original procedure. We may allude, also, to procedures which combine two or even three methods, thus aiming to secure drainage by more than one channel.

The surgeon will be wise if he chooses a procedure which shall possess the following features:

- (1.) One that inflicts the least traumatism.
- (2.) One that is as free as possible from the danger of deep hemorrhage.
- (3.) One that is unlikely to damage the lens.
- (4.) One that is relatively easy of execution.

- (5.) One that is free from the danger of late infection.
- (6.) One that will insure permanent reduction of tension.
- (7.) One that will not lead to hypotony.
- (8.) One that will be free from irritative phenomena during or subsequent to healing.
- (9.) One that will relieve pain.
- (10.) One that will preserve or increase central vision.
- (11.) One that will preserve or increase the form field at the time of operation.
- (12.) One that will be equally applicable to the various forms of glaucoma.
- (13.) One that may be useful in certain forms of secondary glaucoma.

In my experience Luedde's winged incision iridectomy more nearly fulfills the above indications than any other operative procedure with which I am acquainted.

Of the various methods enumerated, basal iridectomy (v. Graefe) is unquestionably efficacious in acute glaucoma. Some surgeons, as Reese, would have us believe that it is equally efficacious in chronic congestive and simple glaucoma. Reese's subconjunctival keratome incision is followed by daily massage, with the avowed purpose of forming a large subconjunctival bleb; in other words, he endeavors, by pressure, to interrupt or break the perfect coaptation of the beveled incision, so as to prevent perfect contact of the lips of the wound. Healing probably takes place with minute orifices in the linear scar, so that the operation is, in effect, a basal iridectomy plus linear subconjunctival filtration. It seems probable that the efficacy of his operation in simple glaucoma is due rather



to the subconjunctival linear filtration than to the iridectomy.

There may be no objection to separating the root of the iris and ciliary body with a delicate spatula, a sort of reverse cyclodialysis, as suggested by Török, which would enable drainage to take place into the suprachoroidal space, thus utilizing all possible drainage channels. I am inclined to believe, however, that this procedure would add somewhat to the hazards of the operation without any real gain.

As far as I know histologic confirmation of the persistence of subconjunctival filtration thru these linear scars is lacking, but it is fair to assume that the existence of a slight elevation of the conjunctiva along the track of the incision (analogous to the "bleb" formation after trephining) points in this direction. It may be recalled that in normal unoperated eyes it is possible to "dent" the sclera in the circumcorneal region by pressure with the tip of a probe; this "physiologic pitting" should not be confused with the evidence of filtration mentioned above.

Those of you who are not familiar with Dr. Luedde's technic would do well to read his papers (*Trans. Am. Ophthal. Soc.* 1922) and (*Am. J. Ophthalm.*, May, 1924). I believe that I have followed his description pretty closely but as I may have deviated in one or two minor points, I will describe the operation as I have performed it in the cases herewith reported.

After the usual general preparation of the patient, the lids and adnexa are scrubbed with liquid soap and water and the eye is flooded with a 4 percent solution of protargol. In order to insure a protargol bath the patient's head is tilted so that a little pool of the solution forms at the inner canthus. The patient is told to open and close his eyes several times during the five minutes the protargol is in contact with the eye. The conjunctival sac is then thoroly irrigated with boric solution, the caruncle carefully wiped with a conical swab, the lid margins wiped with another swab and the eye cocainized. After the second drop of

cocain-adrenalin, 5 minims of a 2 percent novocain solution (with adrenalin) is injected subconjunctivally 3 mm. below the lower corneal margin. Three more drops of cocain are instilled at 2 minute intervals and the eye is ready.

**OPERATION:** A large Elliot flap is made, the end terminating 2 mm. from the limbus on either side. Dissection is largely confined to the central portion, the endeavor being to bare the episclera at the upper pole of the cornea and 3 mm. to either side. A suture is passed thru the upper temporal portion of the flap and a similar suture thru the upper nasal portion. The loops are left long, are disposed out of the way and the flap turned down over the cornea. A 3 mm. keratome incision is quickly made, the point of the keratome entering 1 mm. back of the limbus. Properly performed, this maneuver can be carried out without loss of aqueous. A delicate spatula is introduced into the wound on the flat and very slightly turned, thus permitting one or two drops of aqueous to leak out. Following this keratotomy or paracentesis, the eye will be found distinctly soft. Rather heavy Stevens' scissors are introduced into the nasal end of the wound and a 3 mm. snip made thru the sclera. A similar incision is made at the temporal end of the incision. These scissors cuts are angled slightly upward so as to form with the keratome incision obtuse angles. The iris is withdrawn slowly but fully and a cut is made with the scissors held vertically. The iris is now drawn upward and to the temporal side and the iridectomy completed by one or more snips of the scissors held horizontally. The sutures are then tied: occasionally a third suture is placed at the apex of the flap. The angles of the coloboma are inspected. If not in good position, they are coaxed into place by a circular massaging motion of the Daviel spoon on the cornea. Only rarely is it necessary to introduce the spatula into the anterior chamber.

In case of acute glaucoma, an intra-orbital injection of 3.5 c.c. of 2 percent

novocain-adrenalin is made (instead of the subconjunctival injection). During convalescence the eye is massaged every other day.

#### CASE REPORTS.

CASE 1. Mrs. E. S., age 62, seen May, 1924. Right eye operated 10 years ago for glaucoma. Left, halos past 8 years. No pain, but vision has gradually failed.

Right, glaucoma absolutum, with secondary cataract (operation was apparently a trephining). Vision = 0. Left vision = 6/20. Field contracted, almost to fixation point above, and does not extend beyond 20° below. R. T. = 44; L. T. = 72 (Schiötz). Ophthalmoscope: Deep glaucomatous cup with atrophy.

June 2. "Winged" iridectomy. Eye massaged gently every second day. Uneventful recovery.

June 30. Vision with correction, 6/20.

Seen November 12. L. T. = 18. Vision = 6/32. Probably fixation point has been invaded. Prognosis not good.

CASE 2. R. C. T., male, age 39, seen first July 22, 1922. Left vision failing three years. This eye has been practically blind for two years. R. V. = 6/7.5. Form field, full. R. T. = 31 (Schiötz); no appreciable cupping. L. V. = HM ½ meter. Deep glaucomatous cup. L. T. = 60 (Schiötz). Patient was treated with miotics to January, 1924. During this time tension, right, varied from 24 to 36. Form field contracted slightly temporally, vision remained 6/7.5.

January 19, 1924. "Winged" iridectomy; three sutures in flap. Uneventful convalescence during which eye was massaged daily. January 29, 1924. R. T. = 19-½ (Schiötz). Tension has remained constantly at 18. V. = 6/6 and field has enlarged to dimensions of first observation.

CASE 3. Left eye of R. C. T. (Case 2). Patient insisted on operation on left (blind eye) because of recurrent attacks of pain. Operation identical with that on right eye, performed April 10, 1924. Massaged during convalescence. Now there is good blebbing

along line of incision and tension has been reduced from 64 to 20. There is no improvement in vision but pain has not returned since the operation.

CASE 4. Miss G. R., age 26, consulted me November 26, 1924. Diagnosis of glaucoma was made eight years ago. Was treated at Barnes Hospital for ethmoidal and sphenoidal disease. Was under Dr. Shahan's care several years ago. During his observation she developed small central scotomata. He urged operation, which was declined.

R. V. = 6/80, small central scotoma.

L. V. = 6/80, small central scotoma.

R. T. = 33-½; L. T. = 31 (Schiötz). Both eyes deep glaucomatous cups with atrophy. Both fields contracted, right more than left.

December 15. Iridectomy with lateral wings on left eye. Hemorrhage from iris into chamber, irrigated with normal saline. Three sutures. December 30. L. T. = 16-½. Since then it has oscillated between this point and 20. V. = 6/64. Field unchanged.

CASE 5. Right eye of Miss G. R. operated March 2, 1925. Typical uncomplicated operation. Tension April 21 = 18. V. = 6/64. Both V. = 6/50. Field unchanged.

CASE 6. S. M., male, colored, age 58, seen April 9, 1924. Right, blind from injury in childhood. (Corneal haze and evidence of former iritis.) R. V. = 6/40; improved (+2.00 +.50 cx 30°) 6/10. T. = 51 (Schiötz). Field greatly contracted, does not extend beyond 35° in any meridian and in some almost encroaches on fixation point. Operation urged, but declined: patient taking the view that it was the will of God that he should be blind; that it was useless, not to say impious, to run counter to decrees from heaven.

On July 17 I was called in haste to find the patient in agony, suffering from an acute glaucoma of several days' duration. Eye stony hard; anterior chamber filled with blood. Vision = 0. On July 18, after deep orbital injection of 3.5 c.c. of novocain 2 percent, with adrenalin, I performed iridectomy, Luedde's method. The iris could not be seen at first on account of

blood, which was irrigated out with normal saline solution. A good basal iridectomy was made and the flap sutured.

The patient had no pain following the operation and the eye has remained perfectly comfortable ever since. Vision rose to hand motion at  $\frac{1}{2}$  meter, but subsequently deteriorated to light perception. T. = 30 (Schiötz). There were several small hemorrhages into the anterior chamber subsequent to operation.

CASE 7. J. O., age 50, seen November 4, 1924. Left eye began to pain three weeks ago. Under oculist's care daily without relief. Left, steamy cornea, chamber deep, pigment deposits on anterior lens capsule, pupil small, iris slightly vascular. At first glance the picture suggested iritis. Tension was high, the tonometer reading 60 mm. Hg. (Schiötz). Ophthalmoscope showed faint reflex to temporal side, grey-red reflex to nasal side.

The patient was admitted to the hospital and posterior sclerotomy performed, with evacuation of two drops of vitreous. This sufficed to lower the tension temporarily; but two days later it went up again and I performed the winged scissors iridectomy, under deep orbital infiltration. Recovery was prompt and uneventful. Tension dropped to 30, the cornea cleared and the vitreous cleared sufficiently to disclose a grey-red mass covered with pigment patches to the temporal side. This was opaque to transillumination, so a diagnosis of sarcoma of the choroid was made and the eye enucleated

on December 15. The clinical diagnosis was confirmed by Dr. Verhoeff, who reported melanotic spindle cell sarcoma.

(This case illustrates the value of the procedure in secondary glaucoma, due to tumor. The lowering of the tension resulted in a sufficient clearing of the media to permit a clear view of the intraocular growth.)

CASE 8. H. Y., male, age 70, seen May 12, 1924. Glaucoma simplex, both eyes, of several years' duration. R. V. = 6/20+ (not improved); L. V. = 6/30 (+1.50 = 6/10). R. T. = 43; L. T. = 43 (Schiötz). Under miotics tension dropped to 35 but rose again. Both discs showed moderate glaucomatous cupping; chambers shallow; fields greatly contracted, left more than right.

March 9, 1925. Right operated by winged incision; no complication. April 13, R. T. = 18 (Schiötz). R. V. 6/15.

April 15. Eye has normal tension; vision maintained.

CASE 9. M. S., female, age 64. Left eye enucleated following Lagrange operation by a colleague five years ago. Right, chronic glaucoma of several years' duration; well controlled by miotics. Acute glaucoma developed without warning. T. = 72 (Schiötz), reduced to 50 by eserine and subconjunctival injection of adrenalin. Winged incision iridectomy, under orbital anesthesia. Uncomplicated recovery. Tension 18. Vision 6/10.

626 Metropolitan Bldg.

## RETROBULBAR NEURITIS DUE TO FRONTAL SINUSITIS.

L. WALLER DEICHLER, M.D.

PHILADELPHIA, PA.

In this case difficulty in reading had been noticed four days. The visual fields were impaired especially for color. Removal of teeth gave temporary benefit and after opening the ethmoid and sphenoid vision and fields were restored. Read before the Section on Ophthalmology, College of Philadelphia, Oct. 15, 1925.

That the eye may be seriously involved secondary to infection in the nasal sinuses is well understood by all. That one may have severe involvement of these cavities without disturbance of vision is also common. For it is rather the rule, when there is an abundance of pus in the nasal fossae

There was no history of trauma, and no pain or other inflammatory symptoms. The past history was negative. Habits are good, except perhaps, that the indulgence in 10 to 12 cigars a day may be excessive for this individual.

His vision without glasses in the right eye was 15/40, improved with

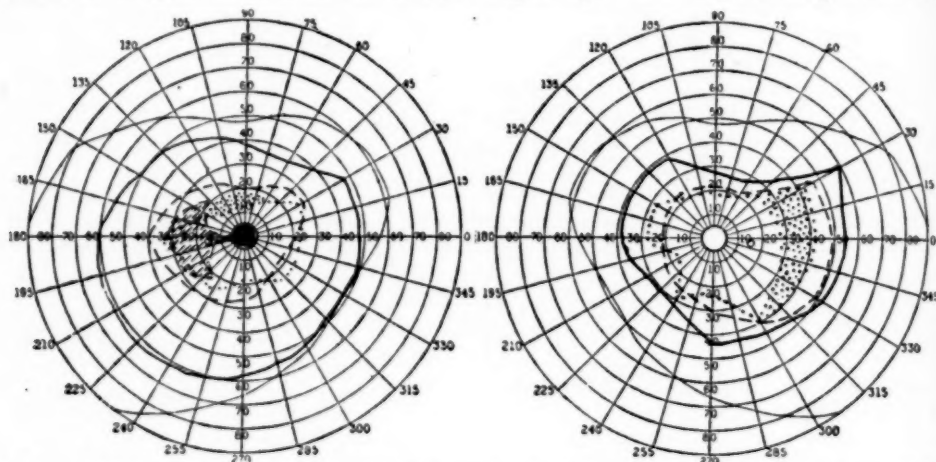


Fig. 1. Fields in retrobulbar neuritis (Deichler's case). Solid line boundary of field for form; broken line boundary of field for red; dotted line boundary of field for green. Area in black absolute central scotoma. Area in broken line shading, scotoma for red. Dotted area scotoma for green. April 21, 1925.

from a freely discharging sinus, symptoms referable to the eyes are ordinarily lacking. Finally in retrobulbar neuritis, the posterior sinuses but especially the sphenoids are the chief offenders. This case is presented because of the severity of the effects upon the eye of a case of hidden involvement, progressive optic atrophy following retrobulbar neuritis, with subsequent marked improvement following operative interference, and, I am hopeful, also improved because of the treatment which the case received.

Mr. E. W. S., 42 years of age, accountant by occupation, presented himself for examination on April 21, 1925, complaining that for the past 4 days he noticed increasing difficulty in reading with his left eye and an increasing fog in front of both eyes.

glasses to 15/15; in the left eye 15/200, without glasses, and no improvement with them. Examination revealed for both eyes that the lids and lacrimal apparatus were negative, and that there was some engorgement of the palpebral conjunctiva, especially in the cul de sacs. The follicles were prominent. The corneas clear; the anterior chambers normal. Pupils were equal, round, 4 mm. in diameter, with prompt reaction to light and accommodation and good consensual reflex in each eye. Ocular movements were normal. Media clear. Disc margins well defined; nerve good color; vessels normal. No gross lesions noted in the fundus. Tension was normal.

The pupils were dilated by homatropin. They dilated evenly and fully, and nothing further was added as a re-



sult of the ophthalmoscopic examination. Form and color fields in both eyes were taken. These showed a marked contraction of the form fields in both eyes; color fields were especially contracted in the left eye. There

size of a pin head, with slight disturbance in the choroid to the temporal side of the disc. Transillumination revealed negative sinuses with rather denser shadows over both maxillary sinuses than usual. Several teeth were

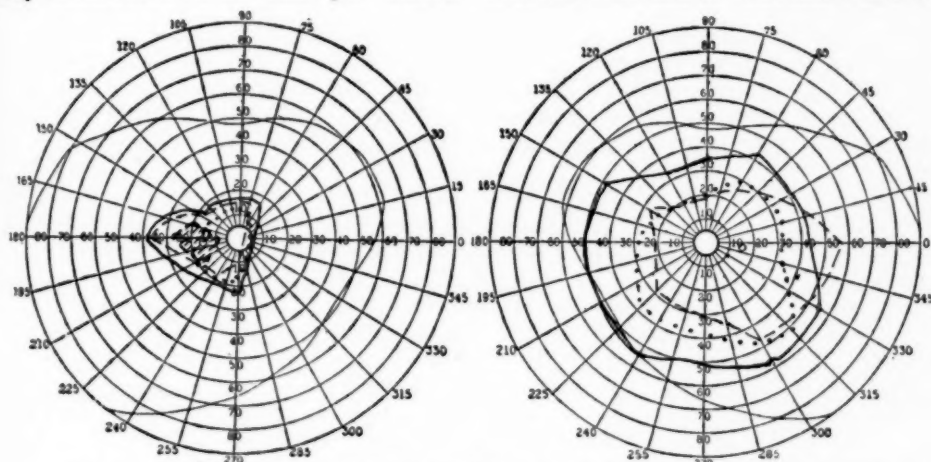


Fig. 2. Fields May 4, 1925. Marked contraction, especially of nasal field of left eye.

was an absolute central scotoma and a paracentral scotoma for red and relative scotoma for green in the field for the left eye and a large relative scoto-

suggestive. This was followed by X-ray of the head, with negative sinuses and negative pituitary, but two teeth were abscessed. These were extracted

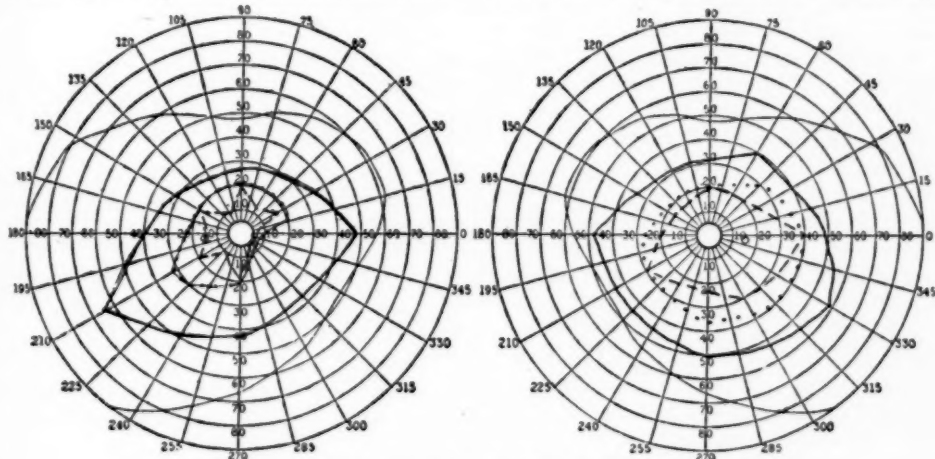


Fig. 3. June 15, 1925. Extension of fields, disappearance of scotoma.

ma for green in the field for the right eye. Blood and urine analyses ordered. Free elimination treatment prescribed, and carefully watched without any definite change until the 25th of April, when there was noted in the left eye, in the macula and just below, two small round hemorrhages, the

on April 28. On this same day, the macula spot had undergone slight change, marked by a deep red ring of congestion, with a yellow center. Fields showed progressive contraction, and on May 4, there was marked contracture with almost complete loss of the nasal field in the left eye both for

form and color, and scotoma much smaller in size, especially the central one. Vision had improved to 15/70, however. Laboratory analyses negative.

On May 5, the disc was becoming somewhat fluffy, especially the upper nasal portion, with beginning edema. Choroidal disturbance to the temporal side of the disc more marked. There was now some incoordination; station somewhat disturbed, and reflexes exaggerated on the right side.

On the 6th day of May the patient gave a history of an acute sinusitis of

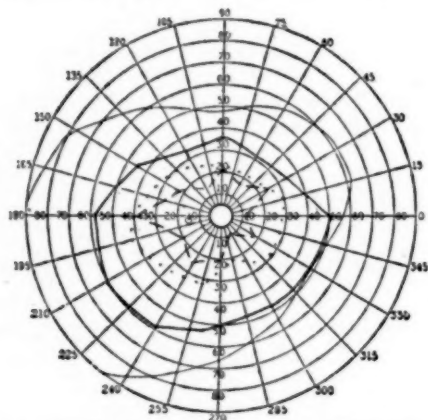


Fig. 4. Field of left eye August 3, 1925. Further extension of fields for form and colors; field for the right had become normal.

the left side two months ago with sudden cessation of the discharge 3 or 4 days before the eye began to bother him. He had forgotten the occurrence until now.

I referred him immediately to the rhinologist, when a diagnosis of left ethmoiditis was made. Operation performed on the 7th of May, with removal of the middle turbinate and ethmoidal and sphenoidal cells freely opened and no pus was found. No changes were noted with the ophthalmoscope until the 12th day of May, when the deeper layers of the nerve began to show pallor, yet vision had improved to 15/50. There was, in addition, a low grade of neuroretinitis still present. The capillaries in the retina at the margin of the disc were especially prominent. On May 16, his vision had improved to 15/40, at which time he began to complain of a pain

over the left frontal region, which increased in severity. On the 26th, vision showed reduction and the ophthalmoscopic examination revealed arteries which seemed to be contracted in comparison with O. D., and veins seemed full. Transillumination revealed a dark shadow over the left frontal cells, when he was again referred to the rhinologist, who on June 1, operated upon the frontal cells by the nasal route. Much pus was found and freely evacuated. His vision had improved to 15/30? Ophthalmoscopic examination revealed increasing paleness in the deeper layers of the nerve, especially to the temporal half, and especially marked in comparison with the nerve in O. D. The difference between the two is becoming rapidly differentiated. Fields now show a spreading, especially to the nasal side in both the form field and in the color field, but still marked irregularity. There is a low grade retinal change thru the fundus, with some small areas of chorioretinal disturbance to the temporal side. Nerve seemed to be slightly better color.

Because pain persisted and the sinus condition was unsatisfactory, the rhinologist, on the 24th of June, opened the frontal sinus by external route and a modified Killian operation was performed, when the cells were found large in size and filled with pus, degenerate membrane and polypoid growths. On July 3, his vision had improved to 15/15, capillaries of the disc prominent, edema had subsided and while the nerve was white, it seemed to be improved in color, certainly in function. Color sense, that had been much interfered with from the beginning, and especially for the determination of red, was now improved; green, yellow, and blue showing the greatest improvement and red remaining decidedly deficient.

His condition since then has gradually improved. He now has 15/15? sight in the left eye, and he has fairly full fields in comparison with what he had before. Similar improvement has been noted in the right eye which now has 15/10 vision.

*Central Medical Bldg.*

## HETEROCHROMIC CYCLITIS WITH CATARACT FORMATION.

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The association of heterochromia and uveitis with cataract formation in relatively young patients is somewhat rare but has been previously described and commented upon. The case here reported was observed under slit lamp illumination with the biomicroscope. Reported to the Ophthalmological Section, Philadelphia College of Physicians, November, 1925.

The condition termed heterochromia iridis, in which the entire iris of one eye differs in color (even if but slightly) from that of the iris of the other eye, may be either of pathologic or nonpathologic nature. Only the pathologic form, associated with a low-grade cyclitis and cataract formation, will be considered briefly in this paper and illustrated by the report of one case.

Heterochromic cyclitis, so designated by Harrison Butler, and by Fuchs, chronic cyclitis with decoloration of the iris, is a relatively rare ocular condition, having been observed by Lutz in about 0.1 percent of the cases at the Zurich clinic. Fuchs, according to von Herrenschwand, reported 38 cases of this condition with cataract formation in 33 of them.

Thought by some observers to be indirectly due to paralysis of the cervicothoracic sympathetic system in certain cases, the exact etiology is not definitely known. In some cases the heterochromia apparently preceded the development of the cyclitis and in others was a subsequent development. To quote Ellett, "If it can be established that the cyclitis preceded the heterochromia, it is not necessary to look beyond the eyeball itself for an explanation of the whole process."

Clinically, the condition occurs usually during the earlier decades of life, more frequently in the male sex (Fuchs), and is characterized by the very insidious development of a low-grade cyclitis without subjective symptoms, unless cataractous changes occur, causing the patient to seek relief for blurred vision in the diseased eye. On examination of the affected eye, there is rarely any ciliary injection to be noted. If present it is extremely slight. The cornea appears to be clear, until on examination with the loupe, when deposits are usually found on the posterior surface. As described by von Herrenschwand, they tend to be

scanty in number, fine, sharply defined, discrete, never agglomerated, and are generally confined to the lower portion of the cornea. They do not tend to form a pyramidal shaped area of deposition and are said to differ in appearance from those found in tuberculosis and syphilis. Against the background of the white cataractous lens and pale iris, they may be entirely overlooked if the cornea is not inspected with the loupe.

The pupil may be slightly irregular and a few posterior synechiae may be present at some time during the course of the disease but do not form a striking feature of the pathologic findings. If the iris of the normal eye is of a brown color, the pale depigmented iris of the affected eye forms a sharp, readily observable contrast. *However, if the irides are normally pale blue in color, the heterochromia may be very slight and may even be entirely overlooked.* (von Herrenschwand; Fuchs.) The affected iris has a dull, lusterless, faded appearance, and altho the delicate trabeculae may not stand out with normal sharpness, gross changes are absent. On the basis of anatomic-pathologic researches, Scherl believed that the heterochromic changes were due to a primary absence of mesodermal pigment (chromatophores) of the iris and choroid. Lutz stated that in the opinion of Fuchs, the changes in the iris and retinal pigment layer could be in all probability considered sequelae of chronic inflammation. According to Butler, in rare instances there may be a development of pigment so that contrary to the usual findings, the darker eye is the diseased eye. Cataract, when present, develops only in the diseased eye and tends to progress to maturity.

On account of the relative rarity of heterochromic cyclitis with cataract formation, the following case is reported:

W. C., a married white man, aged



35 years, was admitted to the cataract service of Dr. J. Milton Griscom at the Wills Hospital, during the latter part of October, 1925. The important features of his ocular history were that about seven months previously he had suffered a sudden attack of pain of about two hours' duration in his right eye. On looking in the mirror he noticed a whitish reflex in the pupil. According to the patient the eye was not red at this time nor at any time before or since. His vision was impaired in this eye and grew worse subsequently. For this reason he came to the clinic. For some time he has had a chronic cough which led him to consult his medical adviser.

Examination on admission to the hospital gave the following findings: O. S., internal and external examination practically normal, the iris being of a pale blue color; media clear. Vision uncorrected was 5/5. O. D., there was no ciliary injection. The cornea was clear on superficial examination. Use of the 6x monocular loupe, however, disclosed the presence of a small number of discrete, punctate, rather small, sharply defined, unpigmented deposits, chiefly on the lower half of the posterior surface of the otherwise clear cornea. The aqueous was clear. The pupil was slightly irregular with a posterior synechia at 4.30 o'clock. The lens was diffusely and densely opaque, the color white, and with no sectors present. Roentgenogram was negative. The color of the iris was slightly paler than that of the other eye and the stroma had a somewhat dull and faded appearance with some loss in distinctness of architecture.

Under the slit lamp and corneal microscope, the small vessels at the collarette, forming the so-called "circulus iridis minor", as well as the delicate radial branches following the trabeculae to within a short distance of the pupillary border where they disappeared within the iris stroma, could be easily seen. As stated by Koby, "the vessels of the iris are partially visible but only if it is not pigmented". There was a striking absence of pigment from the pupillary border. Unlike the depigmentation occurring in senile atrophy, there was no migration of

pigment granules into the stroma of the pupillary zone, there being a total absence of pigment in this area. No brownish reflex from the retinal pigment layer was obtained on oblique illumination. On the other hand, in the unaffected, normal eye, a well marked pigmented pupillary border and a brown reflex were present. The vessels were not visible. Following combined extraction with subsequent capsulotomy, entirely uncomplicated, performed by Dr. Griscom, slit lamp examination of the heterochromic, aphakic eye, showed that the corneal deposits were still present altho less noticeable than before operation. Ophthalmoscopic examination of the affected eye now showed the presence of a veil like, floating vitreous opacity which prevented a clear view of the fundus.

Urinalysis and blood Wassermann were negative for pathologic findings. Examination of the patient, on his discharge from the Wills Hospital, kindly done by Dr. H. M. Miller and his colleagues of the Polyclinic Hospital, gave evidence of pulmonary involvement, possibly of early or latent tuberculous nature, altho several examinations of the sputum were negative for tubercle bacilli. The blood pressure was within normal limits and the blood count practically normal. The laryngologist reported chronic pharyngitis and evidence of chronic sphenoiditis.

#### CONCLUSION.

1. On account of the presence of a low grade, chronic cyclitis of insidious course, with definite signs of depigmentation of the iris of the affected eye, associated with cataract formation without history of previous injury, and without coincident involvement of the other eye, this case would seem to belong under the general head of heterochromic cyclitis or at least a closely related condition. It also probably belongs to that class of heterochromias which are secondary to inflammatory processes rather than to that class in which the heterochromia is the primary condition.

2. Heterochromia may vary from a readily recognizable degree of color difference to that where careful ex-



amination is needed to determine its presence.

3. The value of the slit lamp in studying the iris for finer pigmentary changes is to be emphasized.

4. Judging from a brief review of the literature and case reports, hard

and fast lines of classification can scarcely be drawn, as some cases, while not typical, nevertheless seem to be closely related to heterochromic cyclitis.

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### INFLUENCE OF PROTEIN THERAPY ON EXPERIMENTAL STAPHYLOCOCCI INFECTION OF THE RABBIT'S CORNEA.

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The value of nonspecific protein therapy is established. The relative value of different forms of protein is discussed and for practical reasons diphtheria antitoxin is preferred, used in doses of 1,000 to 5,000 units. Experimental infection of the corneas of rabbits was produced by definite dosage of standardized dilutions of staphylococci emulsion. Differences of virulence were very marked between different strains of microorganisms. No important difference of therapeutic value was found between antidiphtheric serum, concentrated horse serum and typhoid vaccine. Clinical experience shows the value of protein therapy. Read before the Ophthalmic Section, American College of Surgeons, Philadelphia, October, 1925.

At the invitation of your chairman to present my recent observations on protein therapy before this Section, I felt that it might be fitting and opportune at this time to present a phase of this subject not heretofore referred to or discussed in connection with this work, but one, however, which is of especial importance in arriving at conclusions about it. I refer particularly to the study of the influence of protein therapy on experimental staphylococci infection of the rabbit's cornea, which must be regarded as fundamental in theory and in the practice of it.

I shall not review the history of this therapy or discuss the theory of the nonspecific reaction and its probable mechanism of effect. Nor will I touch upon the now changing standards of immunity in this connection. Nor can I but refer to what is known today as "colloid chemistry", and the "colloidal state" of given substances (according to August Lumiere, Kopaczewski and others). Altho these theoretical and chemical phases of the subject are of intense interest, and we hear recently from Prof. Lumiere that "the mechanism of the mysterious colloids holds in suspense the future progress of biology", the time allotted to me will permit but passing reference to them.

It is no longer a field of research which is entirely opposed by the present conceptions of bacterial activity, of specificity and immunity. This has come to pass thru the pressure of in-

sistent demand on the theorist by the accumulating evidence of clinical results in human and in animal experimentation. Altho Ehrlich's side-chain theory may best explain the specificity and mode of action of various antibodies, there is a growing tendency to explain many of these reactions on a physiochemical and colloidal basis. Antigens are substances that cause antibodies in the body fluids. And without exception antigens are colloids and are usually protein in nature. Furthermore, antibodies are colloid in their chemical characteristics. While they may or may not be solutions of colloids, they are, in the final analysis, products of cellular activity, and, therefore, derived from colloidal solutions (colloid dispersions).

Now since there is no longer any doubt that the positive systemic reaction to protein injection is a valuable therapeutic measure, it has become a matter of some debate as to the relative value of different forms of protein, or different preparations of the same form. Also the problem of dosage and the timing of the injection in relation to other treatment, offers a field for investigation which up to this time has not even been approached.

In respect to the selection of the most suitable, highly potential protein available—antidiphtheric serum, as it is now prepared, offers perhaps the best form of foreign protein for administration to the human. Because

milk varies in its potential and toxic action, numerous commercial preparations are now undergoing experimentation. Normal horse serum, "aolan", "yatsencasein", "ciba" (Cibalumin, aseptic solution of egg albumin), albumose, proteose, nonspecific vaccines, etc., have not as yet been shown to possess, with any certainty, a more reactive and potential effect than that of antidiphtheritic serum.

"Aolan" has been heralded as a preferable form because it does not produce a systemic reaction. This is strange, since a positive systemic reaction, that is to say, a moderate rise in temperature, etc., is necessary, in order to establish the preanaphylactic stage of hypersensitivity and thereby increase the resistance of the organism which is believed to be the therapeutic effect. Furthermore the dosage and reaction of other preparations are uncertain. The dosage of the serum is certainly more definite and its anaphylactic effects are more clearly understood. Bانشaf's method of preparing the serum by isolating the antitoxin globulin permits the use of a concentrated serum, which lessens the incidence of serum sickness and facilitates the administration of large doses. According to Park, this method gives a concentration of about six times the original potency. Darier, Frogier and others claim to have shown that it is ten times more potent than normal horse serum, which may be due not only to its high concentration and method of preparation, but also, perhaps, to the constituents attributed to the diphtheria bacillus or toxin.

Moreover, the theory as to the properties and structure of antibodies in immunity lends striking evidence (Vaughan, Kraus, Ichikawa, Ludke), that there may be a direct antagonist, a special antigen or protein (globulin) in the serum more active than a mere animal protein (milk, egg albumin), the method of concentration of the serum adding to the concentration of the antibody elements in the serum. If there is any virtue to be had in the nonspecific diphtheritic elements (colloides?) in the serum, there is a decided advantage and preference in antidiphtheritic serum over other forms

of proteins employed in this therapy. Furthermore, the facility of obtaining and administering suitable doses of antidiphtheritic serum is a distinct advantage not to be overlooked.

As for anaphylaxis, a concentrated serum is not so likely to produce serum sickness as whole serum, since a smaller quantity of it is injected. The history of previous anaphylactic conditions, previous diphtheria, status lymphaticus, asthma or hayfeverlike attacks, in persons proved susceptible in a stable and horse environment, are well established as probable contraindications to serum injections. I have not observed serious anaphylactic effects in any case (now 170 cases treated), and doses have varied from 1,000 to 5,000 units; a total in one case of 12,000 units (given in 3,000 and 2,000 unit doses). These doses are pitifully small when contrasted with those frequently given even for prophylactic purposes in diphtheria (5,000 to 10,000 units), not to mention those employed for the full therapeutic effect (10,000 to 20,000 units). Verhoeff recently reports the injection of 20 c.c. (about 16,000 units) every day for a period of about a month, in a case of sympathetic ophthalmia, and in which case he claims a cure. My own experience, however, has taught me some respect for the highly potent effect of antidiphtheritic serum, and also that small doses of 3 to 4 c.c. (2400 to 3200 units) are harmless, and yet are sufficient to produce moderate systemic reaction just short of anaphylaxis.

It is well known that infections probably represent either an increase of pathogenic power on the part of certain microorganisms, or a disturbance of the defensive mechanism of the host, whereby the normal relations are disturbed; and microorganisms that normally are harmless become infective and disease producing. The severe general reactions observed in acute anaphylaxis and after the first intravenous injection of a foreign protein, differ both theoretically and in their manifestations, yet, in a sense, the results are not dissimilar. In anaphylaxis, a sublethal dose given to a sensitized animal leaves it immune to the toxic protein for a definite pe-

riod, while, in the second instance, following a sharp general reaction there is frequently a marked improvement of the infectious process. In both instances there is an increased resistance to the action of the toxic agent, and the good results observed following nonprotein injection may be an expression of the increased cellular resistance observed in the stage of desensitization in anaphylaxis; in other words, the cells have been made more resistant to the infectious agent by the foreign protein.

The time of injection and the size of the dose have been given much consideration and have been referred to with some emphasis in my previous reports. The matter of anaphylaxis is of importance in this regard because sufficiently large doses are essential, just as they are in the treatment of diphtheria, in order to produce a suitable reaction and effect. This is necessary because the serum is almost immediately effective (ten minutes after injection, Rosenau), and this stage of preanaphylactic effect, representing the incubation period of disease, is the period of gradually increasing sensitivity of the body cells to the protein, or disease element (bacteria), as a measure of body defense against the invader. The first stage of anaphylaxis is known to be one of exhilaration and stimulation, followed by one of depression, paresis, arrest of breathing, etc. For this reason, it is my practice, after cauterizing an active ulcer of the cornea, to have the serum injected as soon as possible. For the same reason, we find an explanation for the constant observation, that the effect of the serum is manifest always within 24 to 48 hours after injection, the time of hypersensitivity and cellular reaction. It is clear, therefore, that the time of the injection is important, as well as the size of the dose and the relation to local treatment.

In this connection, I believe it is generally recognized that a case of hypopyon keratitis in a strong healthy young individual is rarely seen; and when such cases are observed, intensive local measures alone quickly yield the usual good results. On the other hand, we find seriginous ulcer of the

cornea occurring commonly in the aged and in debilitated individuals, usually following upon the neglect of a local injury, and the center of the cornea, the area least protected by systemic resistance, is the area almost invariably affected. Here, the problem of cause and effect is obvious. The question of virulence of the infecting microorganism on the one hand and the defensive powers of the host on the other, is evident. In an effort to secure a fixed virus of staphylococci by standardizing the virulence of a certain strain thru "passage"—and then by suitable dilution of this virus—I have attempted to obtain that dilution which will produce by puncture of the corneal stroma the slightest, but active ulceration of the punctured area.

It is clear, that by this more certain means of standardizing the virulence and controlling the dosage of the infecting microorganism, the matter of resistance becomes the more direct, unknown quantity in the problem of cause and effect. It was found that these dilutions varied greatly with the different strains of staphylococci, taken from various parts of the body, the most virulent strains being those taken from the eye. The dilution was as great as 1 to 30,000 (.01 c.c. of bouillon culture of staphylococci diluted in 300 c.c. of normal salt solution). in order to secure the minimum dosage that would produce the slightest but active ulceration of the rabbit's cornea. (One colony of the 24 hours culture of staphylococci in 10 c.c. of bouillon was cultivated for 24 hours, when .01 c.c. of the bouillon was diluted in 300 c.c. of normal salt solution, thus making a dilution of 1 to 30,000.)

The practical value of this is evident in this study, because we are able thereby to observe the relative value of different forms of protein as well as the dosage necessary to produce the therapeutic effect; and from this, one can more definitely measure the resistance of the animal to the inoculation. Furthermore, it makes one realize how minute must be, as a rule, the average quantity of microorganisms first infecting the eye in a clinical case of hypopyon keratitis, or even in a



penetrating wound, and therefore, if a highly potent protein can be injected before the infection has become overwhelming, a satisfactory result of that which otherwise may have been a calamity, is deserving of our knowledge of these facts.

Now with these theoretic and clinical phases of the subject in mind, the problem as it presents itself at this time may be outlined as follows: First, to determine the relative value of injections of antidiphtheritic serum and normal horse serum, concentrated in the same manner and containing the same nitrogen content, thereby to elucidate the question of the immune body as a possible potent influence in the therapeutic reaction (paraspecific effect?); second, to determine the relative value of different forms of protein (animal, vegetable and bacterial), especially as to milk, "aolan", hemp extract, typhoid vaccine, and tuberculin (T. O.) as they affect staphylococcal and pneumococcal infection of the refractive media of the eye; third, to study the relative value of different methods of injection, i. e.—intradermal, subdermal, intramuscular, and intravenous; fourth, to demonstrate a maximum and minimum dosage in relation to the time and character of the infection; and fifth, to determine the effect of previously injected immunizing doses for prophylactic purposes.

It is quite obvious, that in so far as animal experimentation is concerned, only a small part of the whole problem can be dealt with at one time, and yet each experiment carries with it many factors, entirely separate in importance, but each dove-tailing finally into a more complete analysis and conclusion.

With this in mind, I have during the past two years confined my study to the inoculation of the true cornea with the *Staphylococcus pyogenes aureus*, observing the effects of intramuscular injections of antidiphtheritic serum as against concentrated horse serum, milk and typhoid vaccine. But to pursue such an apparently simple outline of experimentation, one finds very soon that many unexpected difficulties arise, each of which must be worked out separately—problems within problems, for

example, the method of inoculation, standardizing the virulence of the microorganism, the correct dilution of the fixed virus, similarity of the animals, dosage of the protein injected, and many others of less importance.

In this series of 26 experiments, it was necessary to inoculate 94 corneas. The same eye or the same animal was not employed, where any effect from previous inoculation, and possible immunity thereby, could interfere in any sense with the correct interpretation of the results. The rabbits used in each experiment were about the same, within reasonable limits as to size and weight. The same number of rabbits were used for controls as were used for injection. Usually six were inoculated in each experiment, two being injected with antidiphtheritic serum, two with typhoid vaccine (or milk, or concentrated horse serum), and two used as controls.

In preparing the microorganisms for inoculation, the culture was always grown on artificial media for 24 hours before inoculation. At first the cultures were made from infections of different parts of the body, but in the later experiments it was necessary to standardize the virulence of the microorganism. For this purpose a strain from the eye was cultivated and carried along *pari passu* with a strain from another location, for the purpose of studying the relative virulence of each strain for corneal substance, at the same time both strains were being brought to their maximum virulence for the rabbit's cornea thru "passage".

The method of inoculation was as follows: The eye was cocainized; the small rabbit speculum retracted the lids; the superior rectus was grasped with fixation forceps; a small sterile hypodermic needle was introduced into the corneal substance at a point 2 mm. from the upper limbus and carried horizontally by a twisting motion well into the deep stroma and extending for a distance of 3 mm. to the center of the cornea. After turning the needle three times completely around in this punctured wound in order to form a channel of the same size in each instance, it is withdrawn, dipped into staphylococci emulsion and immedi-



ately reintroduced into the channel or puncture wound as before. It is now withdrawn and the needle at once plunged into agar media as a control. In the later experiments, instead of reintroducing the needle after dipping it into staphylococci emulsion, 1/100 of a c.c. of the emulsion was injected by means of a finely graduated pipette into the corneal channel prepared by the needle puncture. The latter method proved to be more accurate, especially when dealing with high dilutions of a very virulent strain of staphylococci.

The method of injecting the protein consisted of inserting the needle into the flank of the animal just in front of the hind legs, carrying the needle forward into the abdominal muscles so that the natural act of jumping might aid in the absorption and rapid assimilation of the protein substance.

The animals were observed daily after inoculation, and when necessary the ocular lesion was studied with the Zeiss magnifier for minute changes. Photographs were made in some instances where the observation was sufficiently clear and of some importance.

Since the time allotted me will not permit of a detail report of these experiments, a brief discussion of them with a short summary may be of interest to you.

#### DISCUSSION.

A study of these experiments shows the three stages of development which this work has undergone in the effort to secure delicate and accurate tests of the effect of foreign protein injection. The first stage embraces the first six experiments which show the comparative effects of protein injection where an unmeasured dose of staphylococci is used for inoculation, but in which nothing as to dosage of injection, or delicate difference in effect, could be observed because of the very violent corneal reaction due to too concentrated an emulsion of the microorganism.

The second stage is observed in experiments 7 to 19 inclusive, in which it was recognized that if the minimum dilution of staphylococci that would produce active ulceration of the cornea could be determined, more accu-

rate and delicate observations would be forthcoming. The determination of the virulence of the staphylococci for corneal substance was attempted by first growing the microorganism in the eye of an animal, the microorganism being recovered, and the dilution of this employed for inoculation. But the varying virulence of the different strains of staphylococci isolated from different parts of the body upset this calculation, as the experiments included in this stage demonstrate. Therefore, the third stage, which includes the last seven experiments (20-26), deals with the development of a more accurate method for determining the virulence of the bacteria, in order to produce more definite bacterial effects. This was accomplished by passing the strains used (one from an acute conjunctivitis, the other from an infected throat) thru the eye of three successive animals, in an effort to standardize the virulence of the microorganism for corneal substance.

The success of the method of inoculation designed to bring about a definite and consistent corneal lesion, other things being equal, depends upon two important factors: 1st, the introduction of the needle; 2nd, the application of the same amount of the staphylococci emulsion in every instance. The first is less important than the second because it is relatively a simple manipulation. When the needle passes into the anterior chamber or comes forward thru the surface of the cornea, such an event is readily observed and felt. In only two or three instances did either of these accidents occur in all the experiments performed, and in none of these were the results recorded. The second factor—application of the staphylococci—proved its importance thru the experimental results. The puncture and repuncture method was fairly accurate where a concentrated solution was used, 1 to 100, as in the first six experiments. Obviously when so small an amount of the solution clings to the needle, and is thus introduced into the sterile corneal channel, it reduces the dosage also by the mere passage of it. In higher dilutions (1 to 10,000; 1 to 30,000), this method was found to be uncertain,

and perhaps inaccurate; and for the same reasons—as indicated by experiments No. 13 to 18. In higher dilutions, it was found to be more dependable to introduce into the punctured cornea 1/100 c.c. of the emulsion from a finely graduated pipette, as noted in experiments 7 to 12. For this reason the latter method was used in the last seven experiments (20 to 26) in which the question of dilution and virulence was being tested.

Dilutions of the staphylococci emulsion varied from 1-100 (used in the first six experiments), to 1-30,000. At first it was thought that the character of the corneal lesion depended solely upon the dilution. As shown in experiments 11 to 19, it was found that the dilution necessary to produce a definite corneal lesion was dependent upon the virulence of the microorganism.

An attempt was made to obtain a virulent strain, by passage of a certain strain thru the anterior chamber of the eye—experiments 7 and 14. But this was found to be unreliable, because one strain proved to be more virulent than the other, and one of them of such low virulence that, as shown in experiments 12, 14, 17, and 18—a very small lesion or even no lesion at all developed as the result of inoculation, altho a dilution of 1-10,000 was used.

Finally, an attempt was made to standardize the virulence of two different strains of staphylococci, by passing each strain successively thru the cornea of three rabbits. This led to the interesting observation that the staphylococcus from acute conjunctivitis was in every instance, more virulent than the strain cultivated from an infected throat, as shown in experiments 20 to 26. In experiments 25 and 26 the corneal lesion from the throat culture was not so advanced as that from the eye culture, altho the dilution of the throat culture (1-1,000) was five times as strong as the dilution of the eye culture (1-5,000). This is certainly definite evidence, demonstrated in every instance—30 eyes being inoculated in experiments 20 to 26 inclusive, all 15 eyes inoculated from the eye culture showing more marked

corneal lesions than the 15 eyes inoculated from the throat culture. Furthermore, this observation at once raises the question whether or not any staphylococcus from a corneal ulcer or acute conjunctivitis has greater virulence or specific effect for the cornea of the rabbit, and whether or not, thru "passage," the virulence of staphylococci from other parts of the body can be raised to a similar virulence to that shown by a strain originally from the eye.

#### CONCLUSIONS.

1. Such an investigation as this is dependent for its accuracy primarily upon the method of inoculation, the determination of a fixed virus thru "passage," and the suitable dilution of this virus.

2. The method of injection, the size of the dose and the relative value of different forms of protein should be worked out with some degree of certainty from the outline of procedure finally demonstrated in these experiments.

3. These experiments also argue without variation in favor of that very interesting and important question of virulence of different strains of staphylococci for corneal substance, as evidenced by the unmistakably greater virulence of the staphylococci cultivated from the eye as compared with those cultivated from the throat. Whether this is entirely a specific effect; or a mere variation in ordinary virulence, remains to be proved.

4. In almost every experiment in which any difference could be noted, the animal which received the protein injection showed the least corneal reaction to the infecting microorganism. No important difference, however, between the effect of antidiphtheritic serum, concentrated horse serum, and typhoid vaccine upon the infection could be observed in any of the experiments. Sterile milk, altho tried in only two experiments (1 and 2), that is 12 rabbits, showed no effect whatever, and the corneal lesions were similar in every way to those of the control animals.

From the clinical point of view may I conclude, that I do not wish to be re-

garded as overenthusiastic about this subject, but I feel bold enough to challenge you to administer antidiphtheritic serum in your next five cases of penetrating wound with infection or of hypopyon keratitis, before the infection has become overwhelming, and then draw your own conclusions.

Furthermore, I wish to affirm that "colloid chemistry" in medicine has come to stay, and the sooner systematic and serious research of the varieties and forms of protein (animal, vegetable and bacterial) and their particular reactions to infection is made, the more valuable will become our

therapeutic strength to combat disease.

On the other hand, I wish to state with some seriousness, that we should not draw conclusions about protein effects too quickly, but rather we should sift the data and take stock, as it were, from time to time as to what has been shown to be reasonably true about it. We cannot accept much that we hear and read, for protein therapy is too popular today to be all that is claimed for it. It is not a "cure-all" by any means. In such instances the credulity of the laity, and even the profession is at stake.

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## NOTES, CASES, INSTRUMENTS

### THE CHROMATIC TEST FOR THE DOMINANT EYE.

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It is pretty well established now that, as a rule, the two eyes do not affect our visual consciousness with equal force. One eye leads the other, and this leading eye is termed the dominant eye. Just as our two hands are unequal in response, both from a motor and sensory standpoint, so are our eyes. And just as people may be right handed or left handed so may they be right eyed or left eyed.

The matter of finding the dominant eye is not merely a subject of academic interest. It is of distinct practical value to determine which is the dominant and which the subordinate eye. As an instance we may mention the value of this knowledge in testing and correcting heterophoria. Relieving prisms, and there are some very good reasons for a greater use of relieving prisms, are most comfortably worn when placed over the subordinate eye. Where a high power prism is necessary, too strong to be placed over one eye,  $1/3$  of the correction may be placed over the dominant eye and  $2/3$  over the subordinate eye.

How to determine the dominant eye? A number of tests have been devised and described, some involving the use of special instruments. One of

the simplest is to ask the patient to line up a pencil, or the index finger of his right or left hand, with a vertical bar, such as the edge of a door or window. If he lines up the pencil with both eyes open, and then closes each eye in turn, he will notice the pencil more nearly in line with one eye than with the other. If the preponderance of the dominant eye is at all marked he will notice on closing the dominant eye that the pencil is way out of alignment with the distant bar.

A simpler and more accurate test which I have employed with success involves the use of the red disk from the trial case. The patient with both eyes open looks at the white muscle light, now furnished in all testing cabinets. I then slip the red disk over the right eye and ask him to note the new color of the light. This will appear more or less reddish. The change in color can be strikingly shown by putting the red disk on and off several times. After the patient has well noted the new color and the extent of change in color, I repeat the test with the red disk over the left eye.

After a few trials the patient will easily be able to tell whether the change from white to red and the reverse is more marked with the disk before the right or the left eye. He will also tell about how much more marked the change of color is, if the difference is considerable. For ex-



ample, with the red disk over the right eye the light may appear as a distinct tho diluted red, while with the disk over the left eye the light may appear as faintly red. In fact this faint redness may only be appreciated by a slight whitening of the light when the disk is removed.

As a check-up I move the red disc alternately from one eye to the other while the patient, now more familiar with the test, notes the different effects. Patients when explained the meaning of this test are intensely interested and cooperate readily. They make note to remember that they are right eyed or left eyed.

This test, which may be called the chromatic test for the dominant eye, has the advantage over the first one mentioned that of lining up a pencil, in that it is a purely visual—sensory test. It does not bring into play any motor activity of other organs. No complications with the sense of direction, nor errors due to one being right handed or left handed can come in; nor errors due to a one-sided position of pencil or bar in lining up. With the red disk we test directly the difference in the strength of visual stimuli and cerebral response. The eye that plays a greater role in the act of binocular vision impresses its distinctive color and therefore colors the light more deeply than does the subordinate eye.

It may be added that the test is best made after each eye has been properly corrected to give it the best vision. Also in cases of marked heterophoria where the red disk is sufficient to cause dissociation of the eyes and resultant diplopia, enough prism has to be placed equally over the two eyes to correct the imbalance and the chromatic test then applied over the prisms.

In this as in other tests a little technic has to be developed in order to get the most out of it. Sometimes when the red disk causes diplopia I move the disk say 15 or 20 inches away from the eyes when, in many cases, the images will fuse. By moving the disk so that it will be alternately before one or the other visual axis, the patient can readily tell the different color

effects and the extent of the changes. By this method also the patient is hardly aware that he is looking thru the red disk with one eye only. Where the disk is applied close to the eyes it is best to mount two red disks to the ends of a simple device such as a pair of compasses. With this arrangement you can place a red disk before either eye, off and on, without moving anything across the patient's face. Sometimes by using indirect vision, that is by having the patient look a little to the side of the target, the coloring effect of the disk can be more easily noted, tho the difference between the two eyes may be less marked.

The foregoing, however, are merely refinements which may or may not be used. The simple red disk alone, found in every trial case, can be made to serve the purpose for the test.

It may also be noted that the chromatic test can be used, not only as a qualitative test, to show which is the dominant and which the subordinate eye, but can be modified to serve as a quantitative test. By employing a series of red disks of increasing depth of color, or of increasing standardized thicknesses, we should be able to find those which will produce equal changes of color in the two eyes. From this a scale to measure the extent of dominance may be worked out.

I have found that occasionally the eye with the lower visual acuity is the dominant eye. From a limited number of experiments I have found that about 6% show left eye dominance, and about 2% show no dominance of either eye. The rest show right eye dominance.

6 W. 98th St.

#### CHANCROID OF THE EYELID.

LEIGHTON F. APPLEMAN, M.D., AND  
S. S. GREENBAUM, M.D.

PHILADELPHIA, PA.

Presented before the Section on Ophthalmology, College of Physicians of Philadelphia, Nov. 19, 1925.

The following case is reported because of its relative infrequency:

L. W., a negress, aged 35 years, pre-



sented herself at the eye dispensary on account of a sore on her right upper eyelid about the junction of the outer and middle third. Examination revealed a deep, tender and painful ulcer with sloping edges, a grayish floor and soft borders. This began as a small pimple about two weeks previously.

Recognizing that this was an unusual type of lesion, S. S. Greenbaum, of the Dermatology-Syphilology Department was consulted; and he stated that it was probably a chancroid.

urethral meatus, one of which had perforated the urethra. The patient stated that she had burning on micturition for the previous three weeks, therefore this preceded the eyelid infection by one week. (The incubation period of chancroid is from 1 to 10 days.) The ulcer on the eyelid healed up very rapidly under the use of hot compresses and iodoform.

These lesions occur very infrequently, as I have been unable to find a report in the literature in the Ophthal-



Fig. 1. Chancroid of right upper eyelid.

Smears from the ulcer were negative on first examination, but on the second examination a Gram-negative bacillus, the Ducrey bacillus, was reported from the laboratory. Autoinoculation test was negative.

Personal history: Two miscarriages; otherwise negative.

Physical examination revealed, as salient features, perforated nasal septum, and perforated soft palate. For these, the patient had been receiving antisyphilitic medication. The Wassermann was 4 plus. Antisyphilitic medication had been given for four months previous to the present illness.

In addition to the above mentioned lesion of the eyelid, the patient presented several painful ulcers along the

mic Year Book in the past several years. J. Herbert Parsons, in his Pathology of the Eye, states that Eudlitz (Arch. gén. de Méd. 1897) found, of 66 cases of soft chancre of the head and face, only 3 on the eyelids.

Altho the literature points to the extreme rarity of this localization of chancroid, and in fact cephalic chancroids were at one time denied, it is quite possible that many go undiagnosed. This is largely due to the fact that many chancroids, particularly nonphagedenic ones, heal spontaneously in from 2 to 6 weeks. The streptobacillus of Ducrey is not always easy to demonstrate in a given lesion. As a chancroid ages, the causative or-

ganisms appear to become less virulent and certainly less numerous. The auto-inoculation test is a simple diagnostic aid in the event of a negative smear, but even this is not always positive as actually happened in this patient. The test is performed by inoculating into a small abrasion in the skin over the deltoid some of the pus from the suspected lesion. Within 48 hours, a typical minute pustuloulcerating lesion appears at the site of the inoculation. The diagnosis thus definitely made, the induced lesion should be immediately destroyed with the actual cautery.

308 S. Sixteenth St.

### FORCEPS FOR POSITIVE FIXATION OF THE GLOBE.

JAS. M. PATTON, M.D.

OMAHA, NEB.

No doubt others have experienced some difficulty with fixation when operating at the limbus, either laterally or above, for paracentesis, anterior sclerotomy, angular keratotomy, etc.

If the fixation is at the opposite side of the cornea there is a tendency to rotation and the fixation point must be as carefully anesthetized as the point of incision. If the fixation is on the same side as the incision the ordinary forceps is in the way of the operator. With the forceps here illustrated the operator is sure of positive fixation, whether operating laterally, above, or below. The line of force is away from the point of fixation, a pull rather than a push, as in the usual method. Only one area of anesthesia is necessary. The sliding catch which is adapted

from the Gifford fixation forceps holds the points firmly together, or the forceps can be used without the catch if so desired. Finally, the large window leaves an unobstructed operating field

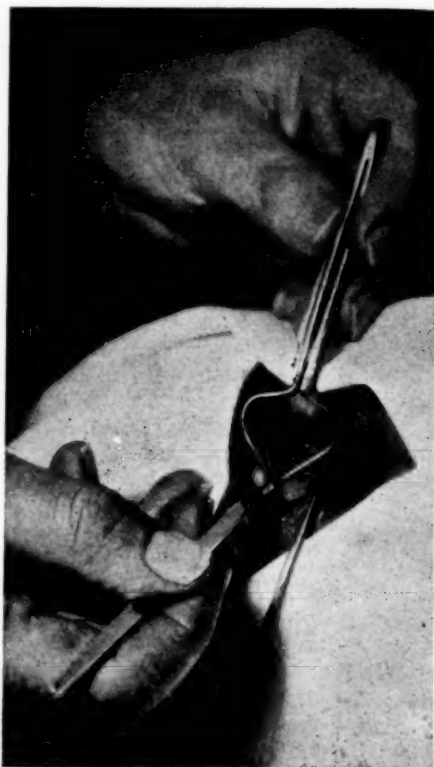


Fig. 2. Method of using forceps. There should be firm fixation of the rectus tendon on the side of the eyeball on which the operation is done.

which is easily accessible and constantly under control.

The forceps were made for me by V. Mueller and Company of Chicago. *Brandeis Theatre Bldg.*

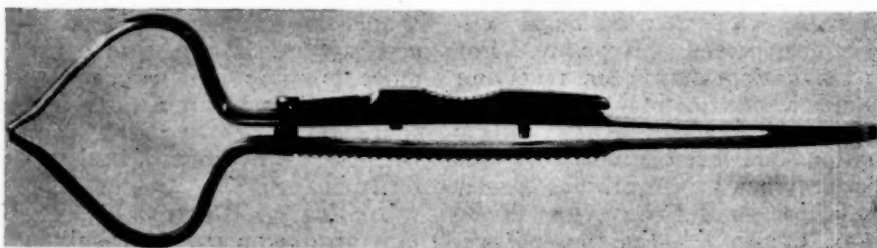


Fig. 1. Side view of forceps showing sliding catch (Patton).

# SOCIETY PROCEEDINGS

ROYAL SOCIETY OF MEDICINE,  
LONDON.

Sections on Ophthalmology and  
Laryngology.

January 8, 1926.

SIR ARNOLD LAWSON, Chairman.

## Optic Neuritis in Relation to Sinusitis.

MR. AFFLECK GREEVES showed a middle aged woman whose retrobulbar neuritis of 6 months duration was cured after the sphenoid, and especially after the ethmoid cells had been explored and evacuated. The culture gave practically pure influenza bacillus. Sir St. Clair Thomson, who did the exploration, confirmed the clinical details.

DR. A. LOGAN TURNER, in opening the debate, said that at a conjoint meeting of the Scottish Society of Otology and Laryngology and the Scottish Ophthalmological Club, in March, 1924, the subject of visual disturbance in relation to affections of the nasal cavities and posterior sinuses was discussed. It eventuated in the appointment of a committee to examine a series of cases of retrobulbar neuritis and submit a report on them in two years. He was able, thru the courtesy of his colleagues, to give a kind of interim report on this work, dealing only with the rhinologic part, basing his remarks on a summary of 28 cases studied by the Edinburgh group. Cases in which the diagnosis was doubtful and instances of syphilis, Leber's atrophy, tumor and tobacco amblyopia were excluded. All the cases in the series belonged to the retrobulbar type of optic neuritis, in which the vision, usually of one eye, was fairly rapidly impaired, but showed a tendency to spontaneously recover, and this was the end result in most of the cases examined. On the rhinologic side the cases had two striking features: the almost entire absence of subjective nasal symptoms and a complete absence of those signs which the rhinologist regarded as evidence of suppurative sinus disease.

For the purposes of discussion, he grouped the cases as follows:

In group A, 3 (possibly 4) cases were regarded by the neurologist as

disseminated sclerosis. In this group the vision had returned almost to normal when the patients were last examined, i. e., to 6/9 in three, to 6/18 in one.

Group B. In 5 in this class, resection of the nasal septum was advised to relieve the crowding in the middle turbinal and olfactory region. In 2 this was performed, the 3 other patients declining it. In all 5 the vision returned to approximately normal.

In group C were 6 cases in which the posterior sinuses were opened. One of them belonged to group A, as it had disseminated sclerosis. In 3 of the operated cases the sinuses were healthy, as microscopically proved. The vision in 2 of these normal cases was unaltered by treatment, there being in both a high degree of defect. In the third, tho the sinus explored was normal, vision improved from fingers at one meter to 6/36. In one case there was a slight catarrhal change in the sphenoidal sinus mucous membrane, but no infiltration by inflammatory cells; vision here improved from 6/18 to 6/9. In the other operative cases no disease of sinuses was detected and vision afterwards improved from hand movements to 6/36 and 6/9 respectively.

Group D, 3 cases of septic teeth, which were extracted and thereafter vision in 2 improved to 6/6 and 6/18 (that of the third was not ascertained).

In the last group, E, were 10 cases in which no nasal interference was carried out. In 4, the vision improved to 6/6, in 1 to 6/9, in 2 to 6/12, in 1 to 6/18 when last tested.

Summarizing, he said that in none of the 25 cases was there any clinical evidence of suppurative sinus disease and in the 6 cases in which the posterior sinuses were opened, no pus or secretion was found. Of the 6 cases in which the posterior sinuses were opened, they were found to be healthy in 3. Of the remainder, the lining membrane in 1 showed slight catarrhal changes and in the other 2 there was gross evidence of congestion of the mucosa. A septal operation was performed in 2 of the 12 cases of narrowing or crowding of the olfactory and middle turbinal area; yet the vision returned to normal or nearly nor-

mal in but a very inconspicuous part in all the cases. In 3 cases septic teeth were a possible causative factor. After they had been extracted vision became normal or nearly so. In estimating the beneficial effect on the vision of surgical interference in nasal or posterior sinus cavities, regard must be had to the fact that in retrobulbar neuritis there was a tendency towards spontaneous cure, and operation might be performed at a time when the vision was naturally tending towards restoration. A further collective investigation was needed.

MR. M. S. MAYOU said the forms of optic neuritis which were associated with nasal disease fell into two main groups having very different clinical and pathologic characteristics. There was, first, papilledema or swelling of the nervehead due to distension of the optic nerve sheath with fluid, causing venous obstruction by pressure on the central retinal vein at its entrance into the globe. This gave rise, chiefly, to a slow, steady failure of vision with very marked swelling of the nervehead; intense congestion of the retinal veins, often with hemorrhages and white patches of exudation into the retina, known in the advanced stage as "choked disc". Secondly, there was retrobulbar or interstitial neuritis in which there was an inflammatory patch or patches of exudation into the trabeculae of the optic nerve, causing direct pressure on the nerve fibers and interference with their function, in some cases bringing about their complete destruction. The only cause of this disease of which there was positive evidence, was disseminated sclerosis in which there were patches of an inflammatory degenerative process in the nerve, tho similar patches might occur from embolic infection thru the blood stream from a septic focus elsewhere in the body, such as a suppurating nasal sinus. The principal signs of the disease were a rapid loss of central vision, the characteristic pupil reaction to light in which, after a maximum contraction of the pupil, it dilated with marked hippus and a tenderness on movement or pressure on the globe. There was also a central scotoma for white and color and sometimes limita-

tions of portions of the peripheral field. Papilledema might occur as the result of a subacute meningitis following a suppurating sphenoid sinus opening beneath the dura, or a spreading necrosis of the cranial bones as the result of operation on or disease in the bones of the nose, and, in rare instances, it might be the result of thrombosis of the cavernous sinus. Papilledema in the case of subdural rupture of the sphenoidal sinus might be present for a very long time before the cause was discovered. He had had a considerable number of cases of retrobulbar neuritis examined by rhinologists, but they had never yet found one in which the sphenoidal sinus was infected. But he had had 3 cases where the antrum was full of pus and 1 in which the ethmoid sinus was infected. After clearing out the antrum and ethmoid all the cases made a satisfactory recovery.

MR. E. D. D. DAVIS said he had studied the notes of 76 cases of retrobulbar neuritis which had been referred to him to make an examination of the nose in order to determine the cause of the eye condition. Those patients were kept under observation for long periods and were followed up. In 30 the cause for the optic condition was not discovered, but nasal disease could be excluded. Disseminated sclerosis was present in 14, syphilis in 9, septic teeth in 7, and in only 7 was there manifest sinus suppuration. He discussed the relationship of the sphenoid and posterior ethmoidal cells to the optic nerve, remarking that optic neuritis arising from inflammation of the nasal sinuses could be produced in the following ways: direct extension by continuity of structure, thrombosis of venous vessels or sinuses, acute nasal catarrh, toxemia or bacteremia. Of the cases in which there was nasal sinus suppuration, operation in three produced a dramatically rapid improvement in the patient's vision; optic atrophy in the other two prevented such a result. Suppuration of the antrum originating in the nose was, practically always, associated with involvement also of the frontal and ethmoidal cells. However, when the antral suppuration was due to diseased teeth, the antrum only was implicated.



In the very numerous dental cases which his work enabled him to see, retrobulbar neuritis had never been recorded. He did not find that a careful study of charts of the fields of vision presented by nasal cases provided any aid to diagnosis. Optic neuritis arising from septic venous thrombosis was rare, and in those cases the acuteness of illness was such as to place in a subsidiary category any symptoms of amblyopia. Nor had he seen retrobulbar neuritis occurring in the course of an acute nasal catarrh. If a patient had an increasing retrobulbar neuritis for which no other cause could be discovered and there was reason to suspect sinus disease, he considered it justifiable to remove the middle turbinal and explore the ethmoidal and sphenoidal cells; in skillful hands the operative risk attending this was practically negligible.

MR. FOSTER MOORE, O. B. E., confined his remarks practically to cases of retrobulbar neuritis, and said several among Mr. Edward Davis' cases did not properly belong to this category. The characteristics of the disease, as generally understood, were a rapid loss of central vision, some pain on movement of or pressure on the globe, an optic disc differing but little from the normal in appearance; a pupil which contracted to light but could not maintain that contraction and a marked tendency for the condition to recover. Commonly it was unilateral and occurred mostly between 20 and 40 years of age. Some surgeons attributed an important role to infection of paranasal sinuses in the causation of retrobulbar neuritis, but in his experience this was one of the rarest of the causes. To facilitate investigation, he admitted all such cases as in-patients, where they were overhauled by various specialists. Some observers appeared to believe that a latent sinus infection might often be the cause of the condition, perhaps because many cases got well after the sinuses had been opened. He felt that such a view needed very critical consideration before it was accepted; he felt that very few such cases would not have got well if nothing operative had been done. Among the cases in Mr. Davis'

list were 14 of disseminated sclerosis and probably in the course of years a considerable proportion of the 30 doubtful cases would be subjects of that disease. In many cases of that disease, retrobulbar neuritis was the first and, at the time, the only discoverable sign of the condition and it might be years before any further manifestation took place. Undoubtedly the optic nerve might be seriously involved by a suppurative process extending to it from any of the surrounding structures, and Mr. Davis had shown that in those cases the inflammation was severe and destructive and in some of these cases blindness had resulted from thrombosis in the vessels in the orbit. In conclusion, he declared that apart from the spread of a suppurative process from surrounding structures which had caused an orbital abscess or thrombosis of the vessels—which few clinicians would include as retrobulbar neuritis—he had never seen a case of the latter which he regarded as due to paranasal disease.

MR. E. TREACHER COLLINS said the case shown today was not true retrobulbar neuritis, but there was marked papillitis; and there could be no doubt about the improvement subsequent to the sinus operations, in vision, subsidence of the swelling and of the retinal exudation. He had not yet seen a case in which a retrobulbar neuritis could be attributed to sinus disease.

MR. F. A. WILLIAMSON-NOBLE said that all cases of retrobulbar neuritis had an optic foramen which was smaller than the normal and this, he said, suggested that one explanation of the condition might be the exertion of pressure on the nerve. In some intractable cases it might be possible to reach the foramen subperiosteally, and enlarge it.

DR. P. WATSON-WILLIAMS said that a considerable number of cases of the kind now discussed proceeded to optic atrophy and everything possible should be done to save the patient from that very serious sequel. Before operation was undertaken each patient should be given a thoro ophthalmologic examination. The cases which had toxic symptoms seemed to be largely those which

showed no marked evidence of suppuration.

DR. J. A. GIBB referred to five cases in his experience in which in coincident retrobulbar neuritis the ethmoidal cells were infected and in those cases, he said, recovery of the eye followed operation on the cells of the sinus concerned.

MR. D. LEIGHTON DAVIES spoke of his own experience and said he found that optic nerve changes in cases of nasal sinus disease were relatively uncommon.

MR. H. M. TRAQUAIR said he had never seen a case of retrobulbar neuritis which could be traced to nasal sinus disease, except in cases in which the nasal sinus was obviously or grossly infected. It was necessary to dissociate pressure conditions from inflammatory conditions. He and his colleagues had found that cases of optic atrophy due to retrobulbar neuritis were quite uncommon. When the disease was bilateral there was a greater tendency to recovery than when unilateral; especially was this so in elderly patients. When the appearance of the disc was normal, the central vision good, and there was no orientation difficulty, great caution should be used in ascribing these to organic disease of the optic nerve.

DR. JOBSON HORNE pointed out that nasal conditions and ocular conditions when existing in the same patient, might be independent of each other. In a few cases, blindness had followed treatment of sphenoidal sinus disease. He agreed with Dr. Logan Turner's and Mr. Foster Moore's conclusions on the subject.

MR. A. L. WHITEHEAD remarked that in only two of his cases of optic neuritis and papilledema with retinal changes could any connection be established with sinus suppuration and in them the disease was of a gross degree. In them, opening up of the cells was followed by some improved vision, but this was limited by atrophy in the retina. Some of the cases narrated in this discussion might, he thought, be equally explained by a blood or lymph infection.

SIR ST. CLAIR THOMSON said he had had but few of these cases, but a typi-

cal one was that of the lady shown today. She had had no symptoms pointing to sinus disease, but when he had opened the sphenoid she improved somewhat. Later he opened the posterior ethmoidal cells where there was cystic degeneration, and following that she became quite well. Of two others, one got well after operation on sinuses, but the eye of the other patient still remained blind in spite of sinus evacuation.

MR. GRAY CLEGG said that in no case had he felt that a retrobulbar neuritis had been due to disease of the posterior ethmoid cells or the sphenoid sinus.

H. DICKINSON,  
Secretary.

#### BALTIMORE MEDICAL SOCIETY. Section of Ophthalmology.

January 28, 1926.

DR. ALAN C. WOODS, Chairman.

#### Voluntary Nystagmus.

DR. HARRY FRIEDENWALD presented a case of voluntary nystagmus. The patient was a medical student, age 23, with perfect vision and no history of eye trouble. There was no error of refraction. Muscles and eyegrounds were normal. About 5 years ago he had acquired the ability to produce a rapid oscillatory nystagmus by trying to count the railroad ties while in the moving train. The oscillations are too rapid to be counted and vary in extent. They are commonly lateral and equally rapid in each direction. Occasionally in looking up he produces a vertical nystagmus. Unlike other reported cases, this patient has no difficulty in producing the nystagmus with the eye turned in any direction and there is no convergence with the nystagmus. There appears to be a slight contraction of the pupils. Patient has no difficulty in continuing for some time, but if too long, then the eyes become watery and tired.

The speaker referred to the cases which had already been reported. Fifteen such cases were collected by Brueckner (*Zeit. für Augenheil.*, 1917, vol. 37, p. 184), and a good summary of the cases is to be found in Wilbrand-Saenger, vol. 8, p. 313. Of ten males,

five were physicians, which indicates that the condition is much more frequent than generally assumed.

#### Conjunctival Suture and Cataract Operations.

DR. CONRAD BERENS first reviewed the subject historically and then presented in detail the stages of his operation, which has already been published elsewhere. He was of the opinion that conjunctival suture did not add materially to the length of time of the operation and that if the sutures were placed in the way which he advised they did not hinder the making of the incision. This answered the two main objections which had in the past been brought against the use of the conjunctival suture. Dr. Berens felt that with the suture in place, iris prolapse, loss of vitreous and other accidents of the operation were greatly lessened.

DR. WILLIAM H. WILMER in opening the discussion, said that he felt the character and circumstances of the patient merited very careful consideration. For the private patient who could afford a day and night special nurse, conjunctival suture was unnecessary and undesirable; for the public ward case, especially in clinics where facilities for the postoperative care were not of the best, conjunctival suture was to be highly recommended.

DR. HARRY FRIEDENWALD said that some years ago conjunctival suture had been strongly advocated by Dr. Koller of New York, and that he had used Dr. Koller's method for a time, but had given it up as having no special advantages. As regards the untied suture which Dr. Berens recommended, he said that he had never used it in cataract, but that it was his habit to close the conjunctival incision after Elliot trephine operations by such a continuous untied suture.

#### Modern Refinements of Ophthalmoscopy.

DR. JONAS S. FRIEDENWALD presented an historical review of the development of the ophthalmoscope with special reference to reflectless ophthalmoscopy and ophthalmoscopy in red free light. The original contributions of which he made mention will be published elsewhere.

#### Metastatic Carcinoma of the Choroid.

DR. C. A. CLAPP presented two cases of this condition. His paper will be published in full elsewhere in this Journal.

JONAS S. FRIEDENWALD,  
Secretary.

#### ST. LOUIS OPHTHALMIC SOCIETY.

October 30, 1925.

DR. J. F. SHOEMAKER, Presiding.

#### Muscae Volitantes.

DR. A. E. EWING translated the term as "flitting or darting flies". The physicians have connected the term only with the shadows on the retina from physiologic cells in the vitreous; the clinicians, however, have given it a broader meaning by applying it to any entoptic shadow on the retina. The latter is the sense in which it is used in this paper, thus including shadows from moving objects in the retina, especially the "bright points" of Purkinje which were believed by him to arise from retarded groups of blood corpuscles in the finer capillaries of the retina. These "bright points" are visible on looking at the blue sky or grey or white clouds. The author said that his first personal serious experience with them was during a severe attack of grippe. He then mentioned three other cases, the last that of a woman who was almost insane because a quasioculist had told her she probably had an incipient optic atrophy, an opinion which he evidently had based on an extension of the medullated nerve sheath into the retina, as this condition was present at the disc margins of each eye. Vision in each eye was normal and remained so during the twenty years the patient was under observation. However, the first five years of this time were required to dispel the illusion.

The "bright points" as they appear to the author are brilliant points approaching or receding from the eye, bright lines curved or doubly curved with dark borders, or dark points or lines with bright borders. They may be accounted for, as was believed by Purkinje, by the pressure which is exerted on the sensitive layer of the retina by globules of blood in very narrow capillaries. Other possible explanations of these "bright



points" may be that they are shadows on the sensitive layer from such accumulations of blood corpuscles in the fine capillaries, or from the hemoglobin of red blood corpuscles when the corpuscles are in certain positions. These two last explanations would account for the dark points or lines with bright borders. The bright points or lines with dark borders may be the result of light focussed thru white blood corpuscles on the sensitive retinal layer. Another possibility is that these light flashes may be due to resistances in the finer nerve fibrils, similar to the flashes that occur in resistances in electrically charged wires and that they are akin to the phosphenes which are developed by pressure on the eyeball. Supporting such a theory is the fact that these "bright points" are more noticeable during an illness when the nerve condition is diminished. The author has observed that when he is hungry they are more noticeable than just after a meal.

If the theory of irritation from blood globules is correct, the "bright points" should be seen at night or in the dark just as phosphenes are seen at night. The same might be said of the nerve fibril resistance theory, but in this case the retina is inactive at night or in the dark and there is no transmission load on the fibrils such as would be demanded in daylight.

The most tenable of the theories is that the "bright points" are shadows from blood globules, or from red or white blood corpuscles.

Accompanying the paper there was a demonstration of the "bright points" of Purkinje by means of a shadow box, the glass for which was the milky ground glass such as is used for showing radiographs. The retinal net work and other entoptic phenomena were demonstrated by means of wide aperture short focused lenses and small lights from various colored flash light bulbs.

*Discussion.* DR. W. E. SHAHAN considered the subject as of considerable importance. All of us have occasion to explain to patients why they see these shadows and spots. The kind that float in the vitreous are usually the little shreds visible with the ophthalmoscope and for which a reasonable explanation can be given. The others are due to the situation of the blood vessels in relation

to the rods and cones. They are so placed that they throw shadows thru the white corpuscles or little groups of red corpuscles upon the rods and cones. They can be demonstrated to the patient by having him look at the sky thru a pinhole opening in a card. When he finds that he can see them and draw them he realizes that the explanation is rational and his alarm subsides. Often our students are asked to look thru these pinholes and practice drawing these entoptic phenomena.

A lady who was a teacher of biology in one of our high schools had been accustomed to looking at some of the lower forms of life thru the microscope. She came with a batch of beautifully drawn serpents and bewhiskered monsters which she had been seeing. She was in a bad mental state. She did not have anything wrong with her eyes, so it was explained that all these appearances were physiologic and she was shown how to evoke them. She was satisfied and her fear of impending blindness was dissipated.

Tscherning was accustomed to make a demonstration of these muscae by means of a mercury vapor light with a cobalt glass in front of it. The idea was to reduce the light to monochromatic light, using short wave lengths to strike the retina, particularly thru the white corpuscles. These are larger than the red ones and highly refractive and transparent and with short waves they can be made to throw a visible shadow upon the rods and cones so as to give the appearance of a swarm of bees.

DR. JULIUS GROSS said that he thought that anyone looking thru a pinhole at a gray sky could see innumerable small particles. Anyone looking into a microscope can see larger floating figures. He believed that both of these manifestations came from the vitreous. The vitreous is not perfectly clear and homogeneous, but is made up of cells the capsules of which largely disappear. Most of these manifestations, in his opinion, were due to opacities and cell remnants in the vitreous.

In his experience only patients who have been ill or are ill, or who are in a state of nervous irritability complain of muscae volitantes. Eventually these muscae disappear, not for the reason that the refraction has been corrected, but be-



cause the general condition of the patient has improved.

### Unusual Vascular Invasion of the Cornea.

DR. J. W. CHARLES reported the case of Mrs. F. R., 49 years old, who was first seen in January, 1901, with a ring ulcer of the cornea of the right eye which was treated with Lugol's solution, silver nitrate 4% applied with a cotton wound probe, and an oily solution of atropin and cocain. In five days the ulcer had ceased to progress. Right eye vision = 15/150; left eye vision = 15/30. In six weeks the eye was almost well.

In January, 1905, the patient developed a ring infiltration of the left cornea, 4 mm. long and about 0.5 mm. from the limbus, with one focus of advance above and below. In five days it occupied two-fifths of the circumference of the cornea. Culture showed pure staphylococcus albus. Right vision = 15/15; left vision = 15/38, each with 0.75 cyl.ax. 90°. In six days the infiltration had broken down and extended in separate foci over part of the dilated pupil. In addition to the usual local remedies, the actual cautery was used. In two weeks the ulcer was clean, but another focus appeared on the central edge toward the pupil. After another cauterization, the ulcer healed rapidly with blood vessels coming in from the opposite limbus which represented about one-half of the clear cornea and was free of infiltration. These vessels extended entirely across the pupil. No vessels entered from the limbus adjacent to the ulcer. Right and left eye, vision = 15/15 with + 2.5 cyl.ax. 90°. In 1909, the corneae were evidently thinned and slightly globular. Right eye vision with + 2. cyl.ax, 175° = 19/15; left eye vision with - 2.5 cyl.ax. 180° = 19/15.

The case illustrates an unusual switching of that reflex which brings blood vessels into the cornea when any portion is irritated for a long period. The usual occurrence is that the vessels enter the cornea at that point of the limbus which is nearest the lesion.

### Telescopic Spectacles in Partial Optic Atrophy.

DR. J. W. CHARLES reported the case of a young engineer, 33 years old, a

graduate of a drink cure institute, who was seen in March, 1923, complaining of failure of vision beginning June, 1922. He smoked two to four cigars daily but had not drunk anything for several months. Wassermann was negative. There was pallor of the macular fibers of the papilla. Vision of right eye = 10/240; left = 13/240. Eliminative treatment was undertaken. In April, 1925, right vision 23/240; left vision 23/120, raised by telescopic glasses to right 23/192; left 23/75. Recently he appeared and stated with his telescopic glass he had enjoyed a movie when seated six or seven rows from the front. With + 9. sph. added (object side), he read the 1.25 D. print of the near vision card and can read the stock reports in the daily paper.

*Discussion.* DR. LAWRENCE POST said that his attention was called by Dr. Graddle, who has done a great deal of work with telescopic lenses, to a matter which has been referred to in one of Dr. Graddle's articles but not published as a separate item: namely, the fact that by using telescopic lenses in cases of amblyopia ex anopsia, the vision in the amblyopic eye can usually be improved to almost 20/20, probably by utilizing the extramacular retinal elements.

DR. JOHN GREEN stated that he regarded telescopic spectacles as having a wide sphere of usefulness in many kinds of poor visioned eyes. Some of his most satisfied patients were elderly ladies with one eye blind from cataract; the other eye with nuclear opacities with reduction of vision to about 20/100. With telescopic glasses and dilation of the pupil he was able to raise the reading vision to Jaeger 1 or 2. Owing to the cumbersome appearance of the spectacles, the small field and the absence of binocular vision, it was often difficult to get patients to persevere in their use, but when they did get used to them they were highly enthusiastic and would not part with them for anything.

### Intraocular Copper Foreign Bodies.

DR. J. A. FLURY reported a case of this kind.

*Discussion.* DR. W. E. SHAHAN observed, for a period of four years, a patient with a fragment of copper dynamite cap in the vitreous. The fragment

could be seen lying in the lower part of the vitreous. Vision remained normal for about  $3\frac{1}{2}$  years. At the end of four years there began to be a greenish discoloration of the anterior capsule and chronic irritation of the whole ciliary region. This progressed to the point where the man was unable to attend to any of his business. Five months later the globe was removed. On incising it the vitreous was found to be fluid.

Later he had a case of cataract in which the condition of the vitreous suggested the possibility of opening the eye and letting out the fluid part of the vitreous in the hope that the mass of copper might come out with it. The patient was a man of 51 years, who had only one eye. An incision was made in the cornea as usual, but before that was completed the vitreous began to flow out. The incision was completed and the globe caved in. The lens nucleus was removed with the loop. The wound gaped. He filled the eye with normal saline, thinking it was a lost eye. When the bandage was removed four days later, the globe had rounded out. Three or four weeks later the cortex filled the anterior chamber to the point where a secondary glaucoma developed. It was necessary again to open the eye; and again it caved in and the globe collapsed. The mass of cortex was worked out and the eye again filled with normal saline. Recovery was uneventful. Final vision was 20/15. It is still a good eye after a year.

This suggests the possibility that in these cases of intravitreal foreign bodies where the vitreous liquifies, an incision large enough to let the fluid part of the vitreous out without damaging the base of the vitreous may be justifiable. If the fluid mass containing copper or copper solution is allowed to run out, or is washed out, there may be a possibility of saving such an eye which otherwise would be lost.

DR. W. F. HARDY said that Dr. Flury pursued one course which he advocated, and that was the use of antitetanic serum in all punctured wounds of the eye. Not only does it protect against tetanus, but it also serves as a foreign protein. It acts very much as milk would act, ex-

cept that you get the effect at the very start and not after inflammation has set in. He has observed a number of such cases and has never seen any severe inflammatory condition follow even when the penetrating particles were dirty and presumably septic.

DR. JOHN GREEN said that he still had under observation a young man, who in 1921 sustained a bilateral injury from the explosion of a dynamite cap. In the right eye there was a punctured wound of the cornea with injury to the iris and lens. A copper fragment was imbedded in the iris and exudate. It was removed and iridectomy performed. A small copper fragment had penetrated the sclera of the left eye and was visible with the ophthalmoscope. Left vision was 20/20.

As soon as the foreign body was removed from the right eye, it responded very kindly and healed, but with traumatic cataract. A year later the lens was extracted: the eye had reasonably good vision (20/60), but with a partial detachment of the retina.

The interesting feature is the behavior of the left eye. The fragment was clearly shown by the X-ray. The eye retained 20/20 vision for about eighteen months. Then fine opacities occurred in the vitreous with ciliary irritation. It was thought that the eye was headed for destruction, but after a month of rest in bed, with atropin locally and K.I. internally, all irritation subsided. Later the lens began to opacify and finally became densely cataractous. An X-ray picture taken four years after the accident showed absolutely no trace of a foreign body. The suggestion was offered that this fragment—it was an extremely minute one—had been converted into a salt of copper which of course would not be revealed by X-ray.

The left eye, after needling, is a perfectly presentable eye cosmetically, but vision is low. There are masses in the vitreous. In most cases of retained copper the eye will sooner or later go on to destruction, but exceptionally, especially if the fragment is small, an eye may be able to cope with the situation, and, after a period of irritation, recover.

JOHN GREEN, JR.,  
Editor.

**CHICAGO OPHTHALMOLOGICAL SOCIETY.**

November 16, 1925.

DR. CHARLES P. SMALL, President.

**Hodgkin's Disease with Report of Postmortem.**

DR. S. J. MEYER said that this case had been presented before the society in the Spring of 1925, while the man was alive. He was a Russian, 37 years of age, with the following history: In 1918, a small nodule appeared at the left angle of the jaw; there was some protrusion of the right eye, but no pain or discomfort at that time. In 1919, at Presbyterian Hospital, a diagnosis of tuberculosis was made and the glands removed. In September 1924, he developed erysipelas of the right side of the face and came to the County Hospital. He was sent home after three days and was not seen again until the latter part of January, 1925, when he returned with erysipelas of the right eye. After four days this subsided, but there remained a swelling of the right eye and he complained of vision being decreased. He came to us again in March, 1925, at which time he was shown to the Society.

The glandular swellings were complicated by the scar of the previous operation. On the right side of the head, the glands were about one-third larger than on the left. The right eye was proptosed, apparently by an orbital growth in the region of the lacrimal gland. The anterior chamber was normal. There was a moderately choked disc with a few patches about the disc. The tension was normal. The left eye and left side of the face were normal.

Biopsy was done at the time, and the diagnosis of Hodgkin's disease was made. The spleen and liver were enlarged and there were enlarged glands in the axillary region.

Ten X-ray treatments were given after which the patient returned with a complaint of severe pain in the head and failing vision of the left eye; the right eye was blind.

DR. A. E. JACKSON, presenting the brain, said that upon the man's entry into the hospital it was noted that he

had a marked proptosis of the right eye and rather marked choked disc, which subsided under X-ray treatments. Shortly afterward diminution of vision without proptosis was noted in the left eye. The right eye was blind from atrophy at this time. The left eye showed a choked disc with considerable swelling.

The man died rather suddenly of gastric hemorrhage. At postmortem it was found that the choked disc in the right eye was the result of lymphogranulomatous masses in the orbit with compression of the optic nerve. In the left eye the choked disc was the result of metastatic lymphogranuloma of the brain. There was also present lymphogranulomatous metastasis of the spleen, liver and stomach, the last named causing death.

The brain showed several walnut sized, white, circumscribed areas in the right frontal and temporal lobes. These areas were definitely harder to the touch than the surrounding brain. Section showed the typical Hodgkin's picture with endothelial proliferation, fibrosis and Dorothy Reed cells. The left orbit was free; the right was filled with granulomatous tissue, which in one place definitely constricted the optic nerve.

*Discussion.* DR. GEORGE SUKER said there were several interesting features from an eye standpoint: (a) choked disc resulting from orbital tumor in one eye, (b) choked disc in the other eye from brain lesion—most likely a degenerative cerebritis. Hodgkin's disease with tumor formation outside of the brain is always unilateral and was in this case.

The lesions of the brain, as could be noted from the anatomic specimen, were mostly unilateral, which gave rise to the supposition that Hodgkin's disease was also unilateral in the brain. Evidently, the lesions were sufficiently large to cause a certain amount of infiltration of the brain, which gave rise to edema, thereby causing choked disc. That the patient did not live long was also proof of its being Hodgkin's disease, because the expectation was seldom longer than one year after the liver involvement.



**Right Homonymous Hemianopsia.**

DRS. E. SELINGER, CLARENCE W. RAINEY, ROBERT CROW, Resident internes Cook County Hospital, presented for Dr. George F. Suker the case of a patient, aged 40, who was admitted to the hospital on September 26, 1925, complaining of sudden loss of vision of four days duration.

He gave a history of an attack of

was not enlarged upon percussion. There was a diastolic murmur, heard best over the aortic area, transmitted downward to the left of the sternum. There was a left herniotomy scar and a depressed healed scar on the right side of the penis. There were no disturbances of pain, temperature or touch. Reflexes were normal. Blood Wassermann was two plus; spinal fluid

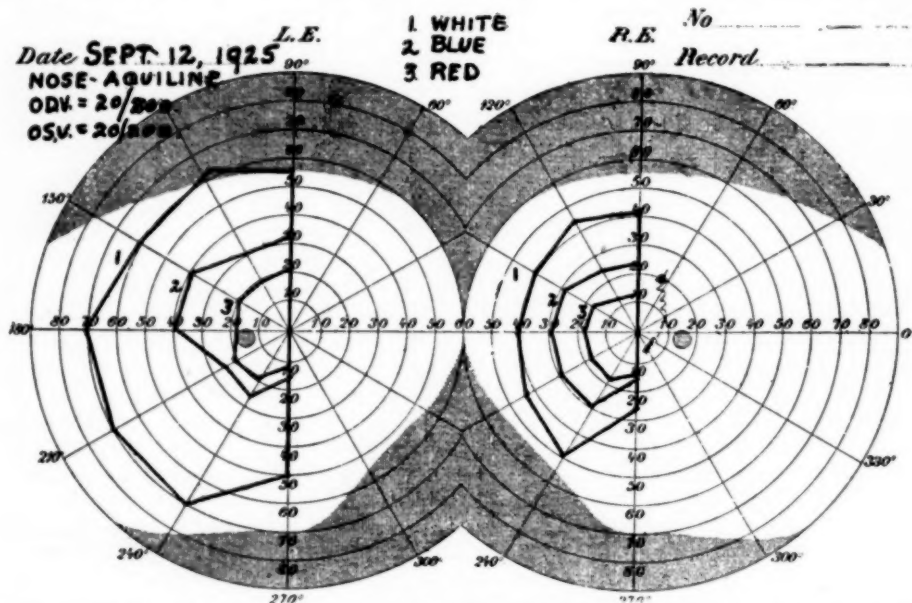


Fig. 1. Perimetry chart, showing right homonymous hemianopsia, with contraction of the visual fields.

transient blindness five years ago, which lasted about an hour, with no visual disturbances since. He had precordial pain and shortness of breath on exertion for many years; had had a herniotomy fourteen years ago. In 1906 he contracted a venereal sore on the glans. He had used tobacco and alcohol, often to excess, especially just previous to the present attack of blindness.

Physical examination revealed a fairly well developed and nourished white male, well oriented, not acutely ill, pulse, temperature and respiration normal. Visual acuity was limited to light perception and projection. The eyes were normal externally except for a slight irregularity of the left pupil. The fundus showed no changes. The chest was emphysematous. The heart

Wassermann negative. Urine was negative on repeated examinations. X-rays of nasal sinuses, chest and sella turcica were negative.

The patient was given mercury rubs, potassium iodid and neoarsphenamin. Cisterna magna puncture was performed and 0.60 mg. bichlorid of mercury in solution administered into the cisterna.

Vision slowly improved. With +1 spheres both eyes, the visual acuity was O. D. 20/40, O. S. 20/20. Perimetry showed complete blindness to the right of the midline in both eyes, with contraction of form field in the part of the fields remaining. There was preservation of the consensual pupillary reaction when a narrow beam of light was thrown from the slit lamp upon the blind side of the retina.



Clinical diagnosis as follows: right homonymous hemianopsia, due to a lesion behind the primary optic centers in the optic radiations or occipital cortex, left side; aortic insufficiency; lues. Dr. George B. Hassin, the neurologic consultant, made a diagnosis of syphilitic thrombosis of the left cuneus lobe and the patient was transferred to the neurologic service, where the diagnosis was confirmed.

On Sept. 30th, the patient complained of pain in the chest, with cough, dyspnea, fever of 104 F., leucocytosis of 14,000, râles in the chest, tubular breathing, pectoriloquy and dullness on percussion. He died on November 8th, of lobar pneumonia.

On postmortem, the spinal fluid showed negative Wassermann. Extensive encephalomalacia of the left occipital cortex (luetie thrombosis); disseminated scars of the leptomeninges; lobar pneumonia of the left upper lobe; bronchopneumonia of the right lung and lower left lobe; luetic aortitis and acute verrucous aortic endocarditis; congenital polycystic kidneys; multiple scars of the glans penis.

**Discussion.** DR. SUKER said this case was anatomic proof that the cuneus lobe was the cortical center of vision, and that the papillomacular bundle of fibers had a complete decussation. The left cuneus lobe was entirely degenerated because of syphilitic hemorrhages. It was absolutely impossible for hysteria to simulate homonymous hemianopsia. That this man was luetic was known from the characteristic pigmentary lesions in the retina. The negative Wassermann was accounted for by the fact of its being a cardiovascular syphilis which very frequently gave a negative Wassermann.

#### **Cataract Apparently Following a Subconjunctival Injection of Sodium Chlorid.**

DR. J. H. ROTH read a paper on this subject reporting a case of iridocyclitis treated for eight weeks, showing a pupil moderately dilated, intense ciliary injection and dense deposits on the posterior surface of the cornea and on the lens in the pupil. Subconjunctival injections were given for several

months and after the last of these the patient noticed that the vision was reduced to seeing shadows; and cataract was found that remained the same since. The possible influence of iridocyclitis, adhesions of iris and lens, and



Fig. 2. Upper section shows thickened meninges and focal hemorrhages in the brain substance of the right cuneus lobe. Lower section shows in addition extensive encephalomalacia of the left cuneus lobe.

alterations in the lens nutrition were considered as causes of lens opacity.

**Discussion.** DR. HARRY E. WOODRUFF had seen this case a number of times. It was a very severe case of iridocyclitis, probably of dental origin. He doubted very much if the subconjunctival injections had had anything to do with the cataract, as the patient had a disease that in itself might be the cause of lens opacity. He questioned whether subconjunctival injections of salt solution would have any influence on the disease itself. The injection should be made more deeply, using some drug that produced a marked reaction, such as cyanid of mercury. The effect of mercury injection was of

course well known; no particularly bad result followed and he believed that not only in acute infections but in immature cataracts there was some absorption promoted. The one objection, the formation of adhesions between the conjunctiva and the sclera, was done away with if the injection was made into the orbit instead of under the conjunctiva.

DR. ROBERT VON DER HEYDT asked how often the lens had been examined in the period from March to August. This might have thrown some light on the subject. The incipience of the lens changes during this time would have allowed of a definite diagnosis between cataracta complicata and other types of lens pathology. The apparent immaturity of the lens clouding would still have allowed of a diagnosis of whether or not one was dealing with an advancing cataracta complicata.

DR. J. H. ROTH (closing) said that the injection which had been called subconjunctival, was in reality given as Dr. Woodruff suggested, postbulbar rather than about the cornea. The lens was examined from time to time and the day the last injection was given, was examined to see how the deposits were progressing—whether getting any thinner or not. He did not remember seeing any other lens opacity. Personally, he did not think it was due to the subconjunctival injections, but was coincidental, or due to the nutrient fluid being changed over a long period of inflammation.

#### The Dental Factor in the Etiology and Treatment of Iritis. (Lantern Demonstration.)

DR. EDWARD H. HATTON pointed out that local immunity is more highly developed in the mouth than anywhere else in the body, and that the regenerative capacity of the hard structures of the tooth is exceedingly limited. The enamel of epithelial origin is not replaced by natural processes, and the cementum is vulnerable at the junction of the mucous membrane and crown of the tooth. Invasion of the root apex is usually around the vessels and is chronic. The thin lining of the pyorrhea pocket favors entrance of

split proteids into the body fluids; the absorption of toxin substances. Circumscribed bacteria zones at the apices of the teeth can furnish bacteria to the blood stream. Chronic mouth infection, prevalent in early adult life, increases later. Both dentist and physician act as judges as to the status of a given tooth and its environment, and team work is necessary. The nature of dental infection must be understood by the ophthalmologist to judge the individual case and to establish reliable data from which the relative importance of dental facts can be deduced.

*Discussion.* DR. CHARLES DARLING thought probably everyone had noticed a great falling off in the past few years of cases of iritis, especially recurrent iritis, probably due to the clearing up of focal infections. He had seen very few cases of iritis that he could attribute to tooth infection, altho of course in a case of iritis a number of different infections were generally present which might be contributing factors, and as one was unable to say which was the definite cause of the disease, all possible causes were cleared up. It seemed that cataract could logically be caused from the teeth. Practically every case of cataract at the County Hospital had a very septic mouth and it seemed logical to assume that as a possible cause of cataract. As Dr. Hatton said, teeth became more or less liable to infection as the patient grew older and very few passed the age of fifty without some infection in their teeth. That might be one of the reasons for senile cataract. He would like to be able to decide whether or not a tooth should be extracted. It would seem, with a case of iritis in which no other etiology than a dead tooth could be found, removal of that tooth might be justified.

DR. E. V. L. BROWN said that in seeking the cause of an iritis, one could not have too good an internist, for he must have almost the judgment of Solomon to find all the possible causes and then decide which was the real one. Dr. Hatton's paper showed how profound a knowledge of dental pathology one actually should have to interpret X-ray findings. In a series of

iritis cases reported by Dr. E. E. Irons and himself in 1923 (J. A. M. A., 1923, Vol. 81, p. 1770), there were five in which dental infection, alone, was considered to be the cause of the trouble and appropriate measures carried out. Four had now been without recurrences for respectively forty-eight, fifty-four, fifty-five and one hundred and three months, average five years. In four other cases, the dental trouble was of such a nature and extent that the dental condition was considered to be the actual cause, altho there were, as well, two with tonsil infection and two with sinus disease (also of a nature and extent sufficient to have caused the iritis). Appropriate dental measures were carried out, and of these four there had been no recurrence in three, over periods of respectively thirty-one, forty-nine, and ninety-one months, an average of five and one-half years. The fourth case had not been heard from. The average for the eight cases was therefore over five years without recurrence.

DR. ROBERT VON DER HEYDT remarked that regarding the incipience of iritis, two types of onset are recognized. One type, characterized by an early increase in the solidity of the aqueous, shows fluctuation in tension. It is characterized mainly by pigment disturbances. This pigment remains in the posterior part of the anterior chamber, because there is an early increase in the viscosity of the aqueous, and it cannot penetrate the aqueous in the earlier stages. Pigment proliferation onto the posterior surface of the cornea is a later change. The other type of onset is recognized by the leucocytic "storm." The aqueous is invaded by thousands of leucocytes. There are mutton tallow spots on the back of the cornea. These two types are not yet classified as to their etiology. Both have given positive as well as negative Wassermanns. There is no question that these two characteristically distinctive types of early onset are different.

DR. OSCAR DODD said that he had recently seen a case which clearly demonstrated the connection between iritis and tooth infection. About nine years

ago, he had treated this patient for iritis, and recently the man came to the office stating that his eye had been inflamed for two days. He had a severe iritis, with rise in tension to 43 mm. and the aqueous was very muddy. Apparently he was in good physical condition, but his teeth were neglected. X-rays of the mouth were taken by his dentist at once, and a very badly diseased root was immediately removed. Four other teeth were infected—one a large molar with two infected roots, and the others were incisors which the dentist thought would not require immediate attention. After treating the eye four days, the tension and congestion became somewhat less. The dentist then removed the other tooth, the one with the bad roots. It was a severe operation and the roots were found to be badly abscessed. The next morning the patient came in with the eye much worse, badly congested, the media very hazy, and the tension 55 mm. Hospitalization and possible operation if the tension remained high seemed the only thing left, but fortunately the eye began to improve that afternoon, and the next morning he returned with the tension normal and the congestion largely gone. In three or four days practically nothing was left but the deposits on Descemet's membrane, and in less than two weeks he had completely recovered. It would not take many such cases to convince ophthalmologists of the connection between root abscesses and iritis.

DR. EDWARD H. HATTON (closing) said that there was no question in his mind that there was a connection between diseases of the teeth and disease conditions of the rest of the body, particularly iritis. It was difficult to determine which tooth or teeth were responsible for the infection and it should be the duty of the dentist to be able to recognize the possible favorable location for such conditions, and choose the teeth that were more responsible than others. Nothing said in his paper should be considered as permitting an infection to exist. There was no more excuse for allowing infection to persist in teeth, whether an apical infection or pyorrhea, than in any other



part of the body. He wished to emphasize that a pulpless tooth was not necessarily an infected tooth, and that the removal of teeth because they were pulpless was not of any great significance in the solution of the problem. A Norwegian bacteriologist (Thiötta, Vierteljsch. f. Zahnheilkunde, 1923, v. 39, p. 65.) summed up the situation rather aptly in the following criticism of the theory of focal infection: "The theory of focal infection, without a doubt, as is common with all new theories, has been overemphasized. If, for example, many dentists in America (as they do) would extract all teeth with treated root canals from healthy people, whether those teeth betrayed pathology or not, that is very distinctly bad practice. If Cotton would have us believe that such mental diseases as dementia precox are to be ascribed to a focal infection, that is to drive the theory to an absurdity. But apart from such excesses, this theory certainly supplies a working hypothesis which offers the key to the solution of many medical riddles."

C. LOEB, M. D.  
Secretary.

### THE KANSAS CITY EYE, NOSE THROAT SOCIETY.

December 17, 1925.

DR. J. W. MAY, Presiding.

#### Amblyopia Without Apparent Cause.

DR. F. S. SHOEMAKER showed an ex-soldier who had had a gun wound in 1918. The bullet having entered the top of the head went out thru the mouth. Immediately afterward he was blind in both eyes and remained so for three or four months and then vision cleared up gradually in the right eye till he could see perfectly with it. The left eye has remained blind ever since the accident in 1918. Three years ago the right eye again went blind and remained so for a year, since when he has seen normally with it. He married while blind in both eyes.

Examination shows right eye normal externally, fundus and fields also normal. The left eye slightly prominent, fairly complete ptosis, pupil reaction good. The media clear and fundus

normal. There is a mild left sided facial paralysis. Vision R. E. 5/5; L. E. nil. Malingering tests negative.

Diagnosis: Left eye: Ptosis, amblyopia, probably hysteric.

#### Ocular Disturbance From Exposure to Infra- and Ultraviolet Rays.

DR. JOSEPH W. MCKEE read a paper on this subject. He covered the conditions of sun blindness, eclipse blindness, electric ophthalmia and cataract caused by exposure to the nonluminous rays. He mentioned the work of Aschkinass, Verhoeff and Bell, Vogt, Lundsgaard, Birch-Hirschfeld, Van der Hoeve and Schang. After considering their work and opinions Dr. McKee came to the following conclusions: (1) The eyes require no protection for radiations from any ordinary illuminant. (2) Practically all infrared and ultraviolet radiations are absorbed in the outer eye and do not reach the retina. (3) Retinal disturbance is due mostly to the heat from the luminous rays. (4) Infrared and ultraviolet radiations are the causative feature in cataract only in so far as they injure the ciliary body and cause a nutritional disturbance to the lens.

*Discussion.* DR. R. J. CURDY said that some interesting and practical facts concerning radiant energy are brought out by Dr. McKee and by the investigations cited in his paper.

Only those radiations within the limits of visibility are capable of refraction, and of concentration by refraction to a focus. This concentration produces enormous intensification of effect, so that the activity of the rays is increased by passing thru a focusing medium. They travel in straight lines, and their activity is diminished by passing thru a medium, the decrease being relative to the capacity of the medium to absorb these rays. On entering a more dense medium their greatest activity is at the surface of contact. The harmful effect of these rays on the eye is therefore limited almost entirely to the conjunctiva and cornea, the deeper structures escaping all but relatively slight effects. The surface injury, conjunctival and corneal, is essentially that of a chemical burn.



The luminous rays when ~~not~~ concentrated to a focus are relatively weak, and not harmful to the eye unless thru prolonged exposure.

In cases of eclipse blindness, direct rays of the sun pass thru cornea, lens and vitreous without injury to these structures. Probably the retina itself would not be injured by short time exposure. But when concentrated to a focus their effect becomes increased to a degree which is destructive, and so it is that the retina alone suffers injury in eclipse blindness.

It is curious that while the infrared heat radiations and the ultraviolet chemical radiations are not capable of concentration by refraction, the thermic and actinic properties of the luminous radiations are concentrated equally with the luminosity. This is an extreme simplification of the complicated physics of radiant energy, but adequate in relation to the effects on the eye of the strong lights used in industry. These lights are excessively strong in both the luminous and nonluminous rays. It would seem then that protecting glasses should have two distinct qualities, that of density sufficient to absorb the nonluminous rays, and that of tint adequate to reduce the luminosity to the limit of toleration by the retina.

DR. J. W. KIMBERLIN,  
Reporter.

## COLLEGE OF PHYSICIANS OF PHILADELPHIA.

### Section on Ophthalmology.

November 19, 1925.

DR. T. B. HOLLOWAY, Chairman.

### Incomplete Remains of the Hyaloid Artery.

DR. BURTON CHANCE exhibited a case of persistent hyaloid artery. The tube was not complete altho it extended far forward, terminating in a hook like thread. There were no other vestigial remains or anomalies. The man had served in the army and stated that he had been credited with full acuteness of vision at every examination during his service. Within the past year the sight of his left eye had failed without any known cause. Uveal pigment was

present in fine spots on the lens and there was a two celled area of choroidal atrophy below the macula with the vitreous so fluid that the hyaloid tube floated about on movement of the globe. Undoubtedly an insidious uveitis caused the loss of sight. The man has been under observation for so short a time that his case has not been studied fully, but was exhibited as a matter of general interest only.

*Discussion.* DR. WILLIAM ZENTMAYER said that he had recently seen a case of complete retention of the hyaloid artery, the first one since acquiring the slit lamp. Ophthalmoscopically, the vessel seemed to be complete. With the slip lamp the greater portion of the posterior capsule between the center and the periphery was seen to be covered by an outspreading white fibrous like mass with numerous lacunae. From this the extension backward could be traced for about one-third of the vitreous. Despite this anomaly the patient had normal vision.

DR. LUTHER C. PETER stated that thru the courtesy of Dr. Zentmayer he had had the opportunity of examining the case to which Dr. Chance referred. It was not possible to follow the hyaloid artery by means of the slit lamp for more than one-third of its length posterior to the lens capsule, altho with the ophthalmoscope it could be followed close to the disc.

### Plastic Correction of Cicatricial Ectropion.

DR. GEORGE H. CROSS presented a case showing the results of plastic repair of the eyelids to correct cicatricial ectropion. The patient, a man aged 50 years, was severely burned with a caustic solution, sodamite. The whole face and the entire left side of the head were involved. The repair of the left upper lid was by a "Gillies Outlay" while the right upper and left lower lids were treated by first dissecting the lids loose and then putting them on a stretch by suturing the edge to a piece of adhesive plaster applied to the face. A thin Thiersch graft from the arm of the patient was then placed in position to cover the raw surface and the whole covered with a layer of Kerr's modeling

ing compound. A bandage was applied with firm, even pressure for six days. The correction of the left lower lid was undertaken just thirteen days ago. Special attention was directed to proper separation of the completely ectropionized eyelid from the cheek by blunt dissection, in the area of facial attachment or what may be called the line of cleavage. This permitted the return of the lid, undamaged except for the loss of the surface epithelium, to its proper place, and aided the return of function, which took place after the surface grafts had healed.

The case illustrated the advantage of extremely thin epidermal grafts. Their color blends with the surrounding tissue so that it is difficult to find the line of demarcation of the graft. When thicker grafts are used there is a marked color difference, with the edges sharply defined.

*Discussion.* DR. WM. CAMPBELL POSEY said the case recalled that of a man with an extensive burn of the face resulting in ectropion of all four lids. Grafts to overcome all these deformities were employed at a single operation. The grafts in the upper lids took, those in the lower sloughed. As the patient was enabled to wink by reason of the restoration of the upper lids to their normal position, he was so satisfied that he permitted the eversion of the lower lids to go uncorrected. An interesting feature of this case was that, altho the patient was a driver, and not withstanding his inability to wink, he had gone twenty years without suffering any loss of visual acuity, altho the epithelium of both corneae was somewhat hazy.

#### **Congenital Bilateral Symmetric Dislocation of the Lens.**

DR. WM. ZENTMAYER exhibited a case of congenital bilateral symmetric downward and inward dislocation of the lenses in a young girl, aged seven years, whose father had a similar malformation. V. R. E. = 3/60; L. E. = 4/30. The lenses were slightly cloudy but showed no localized opacity. Three discissions had been performed on the left eye and the lens was now opaque with fragments of cortex in the anterior chamber. The operation had been undertaken be-

cause of the low vision and the possibility of a secondary glaucoma later in life. Discission was chosen as being the safest. It is difficult of performance as the lens has no attachment above, and backward dislocation may result from the attempt to open the capsule.

A recent case was cited of a young man, aged 16 years, who had a similar anomaly with hypertension. A simple extraction was safely accomplished in one eye with a resulting active, round pupil. Encouraged by the successful result, the other eye was similarly operated upon and lost thru iridocyclitis, resulting in atrophy of the globe.

*Discussion.* DR. S. LEWIS ZIEGLER said that about twenty-five years ago he showed before the Section a case of double dislocation of the lens. The cataract was held by a single attachment up and out. He performed complete discission by entering the knife-needle below the center of the cornea, puncturing the lens with a quick thrust near its center and cutting downward and inward thru its free periphery. This cut was repeated in a second direction so that the cortex was freely exposed to the aqueous. Dissolution was very rapid, there was no reaction and the capsular remains retracted from the pupillary area. The visual result was considerably better than the preoperative test for aphakia which had been made over the free lens margin, under full mydriasis. He recently learned that the patient had maintained this good vision all these years. He thought complete discission is much to be preferred over the loop, since the lens is usually of jelly like consistency and the peripheral adhesion is sometimes so firm as to cause ciliary traumatization when the lens is looped. Where, however, the lens is wholly dislocated he believed nothing was superior to his barbed vectis, since it takes hold firmly and retains its grip on the lens until it is extracted.

DR. WM. CAMPBELL POSEY said he had removed such dislocated lenses both by the loop and by needling. He had been able by the first procedure at times to extract the lens without loss of vitreous and with favorable visual results. In other cases he had not

been so fortunate. When needling, he first endeavored to control the movements of the lens by transfixing it by means of a needle thrust posteriorly to the lens thru the sclera, another needle being used to enter the lens thru the cornea, as usual.

DR. GEORGE H. CROSS said that he had operated a short time ago on a girl aged 8 years, with a double, congenital dislocation of both lenses, the dislocation of the lens in the right eye being outward and in the left eye upward. Vision, R. E. = 20/200; L. E. = 20/100. The choice of operation was influenced by the bad results following a needling seen a short time ago in the case of a young boy who eventually lost his eye. Altho this was not a case of his own, its influence decided against a needling and in favor of removal by a loop. The right eye was selected for operation as it had the poorer vision. No vitreous was lost and the case recovered nicely. A van Lint flap had been prepared as a precautionary measure and was sutured in place following the extraction of the lens.

#### Paralysis of Downward Movements and of Convergence.

DR. WARREN S. REESE exhibited a case of paralysis of the downward movements and of convergence in a man, aged 22 years, first seen July 13, 1925. The following history was obtained: In January, 1923, he began to see double. This lasted two weeks and then both lids drooped. Ptosis lasted two weeks and when it cleared up he could not look down or see near objects. His chief trouble now is that he gets sleepy and has difficulty in walking, as he cannot look down. Examination showed slight ptosis of the left upper lid; lateral ocular movements good; upward movements limited and down movements abolished, the patient being unable to move his eyes at all below the horizontal plane. There was no convergence power and some limitation of adduction of the right eye. Fundus examination was negative. The patient required a +2 spheric lens in front of O.D. to read 1 mm. print at 7.5 inches. With the left eye he could read this print at 9 inches without the sphere. The case

is shown not only because of its rarity but to direct attention to certain ocular complications of encephalitis lethargica which have not received the attention they deserve. These include affections of the upward and downward movements, of convergence, accommodation and divergence. Convergence is frequently affected.

Apparently nothing definite is known of the location of the lesion in these cases. He had talked to several neurologists, especially as to whether the lesions were nuclear or supranuclear. Personally, he felt that the lesion must be above the nuclei. If there are centers for these functions, clinical evidence seems to indicate that those for convergence, accommodation and upward and downward movements must be close together, while divergence has a separate and distinct center. The pupillary reactions in this case seem to suggest that the contraction of the pupils for near is a convergence rather than accommodation reaction. A case of convergence paralysis that he reported two years ago seemed to bear this out as does also a case cited by Parinaud.

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ing compound. A bandage was applied with firm, even pressure for six days. The correction of the left lower lid was undertaken just thirteen days ago. Special attention was directed to proper separation of the completely ectropionized eyelid from the cheek by blunt dissection, in the area of facial attachment or what may be called the line of cleavage. This permitted the return of the lid, undamaged except for the loss of the surface epithelium, to its proper place, and aided the return of function, which took place after the surface grafts had healed.

The case illustrated the advantage of extremely thin epidermal grafts. Their color blends with the surrounding tissue so that it is difficult to find the line of demarcation of the graft. When thicker grafts are used there is a marked color difference, with the edges sharply defined.

*Discussion.* DR. WM. CAMPBELL POSEY said the case recalled that of a man with an extensive burn of the face resulting in ectropion of all four lids. Grafts to overcome all these deformities were employed at a single operation. The grafts in the upper lids took, those in the lower sloughed. As the patient was enabled to wink by reason of the restoration of the upper lids to their normal position, he was so satisfied that he permitted the eversion of the lower lids to go uncorrected. An interesting feature of this case was that, altho the patient was a driver, and not withstanding his inability to wink, he had gone twenty years without suffering any loss of visual acuity, altho the epithelium of both corneae was somewhat hazy.

#### **Congenital Bilateral Symmetric Dislocation of the Lens.**

DR. WM. ZENTMAYER exhibited a case of congenital bilateral symmetric downward and inward dislocation of the lenses in a young girl, aged seven years, whose father had a similar malformation. V. R. E. = 3/60; L. E. = 4/30. The lenses were slightly cloudy but showed no localized opacity. Three discissions had been performed on the left eye and the lens was now opaque with fragments of cortex in the anterior chamber. The operation had been undertaken be-

cause of the low vision and the possibility of secondary glaucoma later in life. Discission was chosen as being the safest. It is difficult of performance as the lens has no attachment above, and backward dislocation may result from the attempt to open the capsule.

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DR. LUTHER C. PETER said that with loss of associated movements upward, downward and in convergence, independent lateral movements good and full in each eye, and elevation and depression of each eye separately better than binocular movements upward and downward, would seem to indicate nuclear involvement, as well as a supranuclear lesion along the aqueduct of Sylvius in the posterior longitudinal bundles.

DR. H. MAXWELL LANGDON said that one of the most interesting things about the ocular complications of lethargic encephalitis is the fact that such minute lesions can remain, affecting so completely certain small portions of the nervous tract and not involve parts which are closely adjacent. In his own experience, considering the extraocular muscles separately and individually, he thought that paralysis of the ciliary muscle was perhaps the most frequent. He had seen loss of convergence alone in the case of a young woman attending the clinic at the infirmary for nervous diseases about two months ago. The conjugate deviation and uniocular rotations were normal, but the convergence was entirely abolished.

DR. LOUIS LEHRFELD said that he was preparing a report on five cases of postencephalitis or Parkinson's syndrome in which the conspicuous ocular finding was a conjugate deviation of the eyeballs upward. He regarded the symptoms at first as a palsy of the inferior rotators but was later convinced that the upward rotation of the eyeballs was spastic, due to irritative changes in those nuclei of the brain generally affected by encephalitis. His conclusions were confirmed by the fact that nurses and orderlies had noted that the upward spasm of the eyeballs of patients might be relaxed by distracting the patient's attention in various ways. The spasm also may be broken when the patient's attention is distracted in the course of eating. The patients themselves describe the spasm of the eyeballs as only temporary in character, sometimes lasting a few moments or several hours and in one particular instance, over a period of days.

DR. SIDNEY L. OLSHO said that while the obscure etiology of this patient's symptoms is being studied he would suggest that he be given such relief

as would be afforded by prisms, six or eight degrees, placed base down, before the eyes.

DR. REESE stated that he had intended to cite Dr. Zentmayer's case and to ask whether it was a case of encephalitis lethargica. His experience has not been the same as Dr. Lehrfeld's, in that these cases clear up. He understood, however, that these palsies are often transient during the acute stage, as Dr. Langdon remarked. He had not been fortunate enough to see these cases during this stage, however.

#### Melanosarcoma of the Palpebral Conjunctiva.

DR. WM. CAMPBELL POSEY reported a case of melanosaarcoma of the palpebral conjunctiva illustrating the malignancy of such growths, occurring in a male, aged 50 years. A small pigmented vascular tumor imbedded in the conjunctiva of the left lower lid had been successfully removed by desiccation ten years previously. The second malignant growth had appeared in the upper lid of the same eye ten months before the report was made and took the form of a pedunculated, pigmented and vascular tumor arising from the fornix. Excision, followed by radium, effected the disappearance of this mass, but involvement of the lacrimal, preauricular and cervical glands of the same side followed. Notwithstanding excision of these tissues and continuous application of radium, metastases occurred in the lungs and brain, causing death. Dr. Posey spoke of the rarity of sarcoma of the conjunctiva in general and of the tendency of nevi of the conjunctiva to become malignant in later life, and he advised the removal of all such growths in patients over thirty years of age, or earlier, if symptoms of malignant activity manifested themselves. He did not share the opinion of Verhoeff and Loring regarding the extreme malignancy of sarcoma of the epibulbar region and did not think enucleation indicated in all such cases, good results often following less radical measures. He gave a report from the literature of a number of cases of sarcoma of the conjunctiva and of nevi of the conjunctiva which later became malignant.

*Discussion.* DR. BURTON CHANCE stated that he had always suspected that the small sarcomata might really be a part of a general sarcomatosis. He desired to record that the two persons from whose epibulbar regions he removed small sarcomas, which recurred twice after excision, but which were satisfactorily treated by desiccation about twelve years ago, as reported at a meeting of the American Ophthalmological Society, are still alive and well and have exhibited no recurrence.

DR. WM. ZENTMAYER inquired if it were possible that some of these cases of sarcoma of the conjunctiva are local manifestations of a general sarcomatosis. This thought occurred to him because of the frequent systemic involvement which should not occur as a result of metastasis if the belief of Collins and others as quoted by Dr. Posey, is correct, namely, that extirpation of the growth alone is sufficient to prevent metastasis.

DR. S. LEWIS ZIEGLER said that he had elsewhere referred to a case of melanosarcoma of the limbus that did not yield to desiccation but did yield to the application of a pencil of carbon dioxid snow. Not only did the growth wholly disappear, leaving apparently normal tissues, but the melanotic deposit was gradually absorbed. More than two years had elapsed and there was no sign of a recurrence. The use of this physical agent ( $\text{CO}_2$ ) requires one or two applications of from 5 to 10 seconds each. There is some reaction which is controlled by applying ice pads for from 24 to 48 hours. After that, positive galvanism is maintained until the ocular tissues recover their normal appearance.

#### **Removal of an Epithelial Plaque at the Corneoscleral Junction by the Shahan Thermophore.**

DR. G. ORAM RING gave the history of a man, aged 65 years, who consulted him last spring regarding a small sessile growth situated exactly at the inner corneoscleral margin of the right eye. He was without pain and the congestion surrounding the growth was exceedingly slight. Its presence had been noted for one week only. The corrected vision was normal. Wassermann negative.

The plaque was nearly round, slightly irregular at the edges, gray-white and about 7 to 8 millimeters in diameter. It was somewhat elevated above the level of the corneoscleral tissue and strongly suggested a small patch of flattened frozen snow, quiescent and attached to the region referred to. There was no history of traumatism and neither family nor personal history was suggestive, and the ocular structures were otherwise normal.

Reference was made to the division of the blastoderms that concern us in the study of ocular growths, namely, the cuticular epiblast, the neural epiblast and the mesoblast. With the first of the above divisions our growth concerns itself, derived as it is from the surface epithelium, which, after embryonal life is over, ceases to prolong itself into the deeper mesoblast. When this characteristic is reversed at the junction of the cornea, malignancy is always to be feared. The work of Collins and Mayou was especially referred to in outlining the above division and it was found difficult to differentiate Dr. Ring's description from that of Mr. Treacher Collins which follows: "At first an epithelioma of the surface of the eye forms a small opaque, white raised patch". Reference was made to the use of the word "plaque" as given in the *American Encyclopedia of Ophthalmology* and to that of Mr. Parsons in the "Pathology of the Eye."

After cocanization of the eye and the instillation of a few drops of a sterile solution of adrenalin chlorid 1-5000, the thermophores at a temperature of 148 degrees was applied to the growth for sixty seconds by means of a conductor with an 8 mm. contact surface. The application was made with the patient in a prone position, a 1-5000 sterile bichlorid ointment applied and the eye bandaged for 24 hours. It occasioned little or no pain and judging from the perfection of the result attained in this instance, as well as in the prompt improvement noted in a series of corneal ulcers in which he has since utilized the method, he regarded it as an exceedingly valuable adjunct to one's ophthalmic armamentarium.

*Discussion.* DR. LUTHER C. PETER said that he wished to add his testi-



mony to that expressed by Dr. Ring, as to the value of the thermophore in the treatment of corneal ulcers of certain types, especially of the sluggish type, to which the ulcer yields so satisfactorily and promptly.

#### **Chancroid of the Eyelid.**

DR. LEIGHTON F. APPLEMAN and DR. S. S. GREENBAUM reported a case which is published in full page 358.

#### **Unusual Meningitic Anthrax.**

DR. FREDERICK KRAUSS presented the case reported in full page 337.

#### **Heterochromic Cyclitis with Cataract Formation.**

DR. JOHN S. PLUMER exhibited a case of which a full report is published on page 349.

*Discussion.* DR. WILLIAM ZENTMAYER said, as he understood the classification, there was a group of congenital cases which showed no evidence of an active inflammatory process altho there was usually a slight deposit on Descemet's membrane if the cases in this group subsequently developed a low grade cyclitis and cataract.

There is a second group which is associated with involvement of the sympathetic nerve. The first class should not be confused with the discoloration of the iris, which takes place in an iridocyclitis and which we may also have as a sequel in the development of cataract. As he understood it, in the first group, there is not a depigmentation of the iris; certainly not in the beginning, but there is a lack of development of the chromatophores. It was not clear to him whether Dr. Plumer's case belonged to the first group or was one of complicated cataract following an acquired uveitis.

C. E. G. SHANNON,  
Secretary.

#### **OMAHA AND COUNCIL BLUFFS OPHTHALMOLOGICAL AND OTOLARYNGOLOGICAL SOCIETY.**

December 16, 1925.

DR. S. D. MAIDEN, Chairman.

#### **Subhyaloid Hemorrhage.**

DR. H. B. LEMERE presented a patient who had had a violent attack of vomiting after which he noticed poor

vision in one eye. Examination the next day showed vision 20/30 and a subhyaloid hemorrhage in the lower temporal quadrant of the retina. There were several other small retinal hemorrhages in this region. Two weeks later the area of hemorrhage had apparently extended, including the whole lower half of the retina. A sort of exudate seemed to be formed in this region, which is raised slightly from the retina and which shows numerous vessels running into it. A general examination, including a Wassermann, was negative.

He has been treated by subconjunctival injections of salt solution and pilocarpin sweats but with no appreciable affect on the condition. Dr. Lemere believes that probably his condition is a condition of beginning retinitis proliferans.

#### **Plastic Repair of Conjunctiva.**

DR. JOHN HOLST showed a case of plastic repair of the conjunctiva following a lye burn. The patient had gotten some solid lye in his conjunctival sac three months before and when seen by Dr. Holst he had developed a marked symblepharon below. Dr. Holst waited until contraction was complete and then dissected off the scar from the bulbar conjunctiva, undermining the bulbar conjunctiva on each side and sewed it together. The area of symblepharon occupying about 10 square millimeters was covered in this way by a conjunctival flap. The eye is now easily movable and very slight scar has resulted. Dr. Holst says that all kinds of glass prostheses are ineffective in preventing symblepharon after such severe burns. He believes in waiting for some time after any severe burn before attempting plastic repair and usually waits slightly longer than in this case.

The program of the evening consisted in talks by Dr. B. M. Kully on Ear, Nose and Throat Study in Vienna, and by Dr. L. C. Bleick on Ophthalmologic Study in Vienna. Dr. Kully described the organization of the MacKenzie study group with which his recent trip was taken. The trip is very well organized so that very little time is wasted. On the boat trip going and coming from Europe three hours of



lectures were held daily, the work given by Dr. Mackenzie himself on tests of the inner ear and labyrinth being especially valuable. In Vienna arrangements have been made with the best teachers, some of whom, such as Professors Neumann and Hajek, lecture only for this group. A brief summary of the different courses taken by Dr. Kully was given with remarks as to their value and the personality and scientific standing of the men who gave them. Dr. Bleick reported that the work given in ophthalmology by this group is also exceedingly good and gave some notes from his course.

S. R. GIFFORD,  
Secretary.

### COLORADO OPHTHALMOLOGICAL SOCIETY.

December 20, 1925.

DR. EDWARD JACKSON, Presiding.

#### Neuroretinitis Complicating Iridocyclitis.

DR. JAMES M. SHIELDS reported contusion of the right eye in a football player, 16 years of age, October 16, 1925. Examination of this eye five days later revealed a turbid aqueous, lack of iris luster and a posterior synechia at 6 o'clock. Atropin was instilled and prescribed for home use and sodium salicylate grains 15 given intravenously on five successive days. The tonsils were removed October 25, 1925, and a pathologic diagnosis of lymphoid hyperplasia reported.

On October 28th the right eye was painful and the anterior chamber filled with blood. The left eye showed a beginning iritis with exudates into the anterior chamber. Atropin was ordered for the left eye, hot compresses for both, and sodium salicylate by vein. November 1st intravenous salicylates were stopped and half gram mercury suppositories at night begun. Improvement was noted and on November 20th atropin was stopped for the right eye and for the left on December 16th. Vision on this date was, O. D. 20/20—, no lens, O. S. 20/40; no lens helped. Fundus examination: O. D. questionable hyperemia. O. S. Disc blurred

and elevated, no definite outline; retinal vessels extremely tortuous and in places lost to view in the swollen retina; minute hemorrhage just below the macula.

The Wassermann was negative and the blood picture also except Hgb. 85%.

*Discussion.* DR. WM. C. FINNOFF said pathologic sections of eyes which have evidenced an iridocyclitis frequently show a histologic picture of neuritis. As regards a hyperemic fundus, we should keep in mind that exudates into the media produce a red appearance of the nerve, therefore we must have frank evidence of neuritis before making a diagnosis.

DR. JOHN McCRAW said a bilateral iridocyclitis is usually suggestive of syphilis.

DR. WM. H. CRISP recalled a case of concomitancy of iridocyclitis and optic neuritis with syphilitic etiology and feels that in these cases a negative Wassermann does not necessarily rule out syphilis.

DR. C. E. WALKER reported a case of perforating injury with iris prolapse followed by iridectomy. The second eye developed a neuroretinitis. A diagnosis of sympathetic disease was made and following removal of the injured eye the neuroretinitis subsided.

DR. GEORGE L. STRADER told of two attacks of intense iridocyclitis which set up in the same eye, the second attack after an interval of one year. Both followed minor injuries to the eye and were relieved in each instance by cocainization and treatment of the middle meatus and ethmoid cells.

DR. EDWARD JACKSON remembered two cases of iridocyclitis with optic neuritis. They were bilateral and in syphilitic subjects but the swelling was not so marked as in the case presented.

#### Choroiditis in Macular Areas.

DR. WM. C. BANE reported the case of a male, age 65, who first consulted him one month ago because of poor vision. He had worn glasses for reading for twenty years. Vision O. D. = 5/10, O. S. 5/10—3. Form field normal; pupils react to light and accommodation; unable to improve vision with lenses. In the macular region of

the right eye are seen finely mottled changes. In the left macular region are numerous sago grain spots covering an area of two disc diameters. Both lenses show marginal opacities. The case was considered one of senile changes in the macula possibly simulating drüsen.

*Discussion.* DR. FRANK R. SPENCER believed that the changes are drüsen because of their depth, however, they are not so clearly cut as those previously seen.

DR. JAMES A. PATTERSON thinks that senile central retinitis is due to focal infection especially of dental origin.

DR. WM. C. FINNOFF thought the exudates white and not yellow such as are not found in a healthy eye. Red free light would help make a differential diagnosis.

DR. E. R. NEEPER said the recording of vision should be done more accurately and the letters miscalled enumerated because some letters are more easily seen than others.

DR. DAVID STRICKLER said if the letters missed are noted, it will be observed that these patients will miscall the same letters at different examinations.

DR. WM. M. BANE uses numbers instead of test letters because he feels they are more delicate test objects.

#### **Pemphigus.**

DR. GEORGE L. STRADER reported a female, age 22, seen first in April, 1923, at which time she was convalescent from an attack of influenza complicated with chicken pox as diagnosed by the family physician. She had had a vesicular eruption on her trunk, arms and face, also lids and conjunctiva. She had been extremely ill and delirious much of the time for five weeks.

Examination revealed numerous scars on her arms, chest and face resembling those after chicken pox and several ulcers on the conjunctiva of the lower lids. The skin on the soles of her feet was exfoliating. The lids were swollen and margins red and there was marked photophobia. Because of the unhealed ulcers of the conjunctiva, a diagnosis of smallpox was favored. There was no corneal involvement.

Treatment was instituted and the patient returned home.

One month later a small central ulcer of the left cornea developed which healed promptly in a few days. The conjunctival ulcers were smaller tho not healed, but the patient returned home. She was not seen again until July, 1925. During the interval she had been under constant treatment by various oculists in Kansas who had diagnosed trachoma. This examination showed extensive symblephara between the conjunctiva of the lower lid and the bulbar conjunctiva. The upper lid had the appearance of an old trachoma. In several places small areas of skin epithelium had invaded and replaced the conjunctival epithelium. On the conjunctival surface of the lower lids were several small openings from which secretion was expressed. Smears of this secretion showed an unusual number of large gram positive bacteria of various shapes and sizes, probably xerosis bacilli. In the superficial epithelial layers of the cornea, there was a dense network of very fine blood vessels. Some of the pockets containing secretion were undermined 4 or 5 mm. There has been a definite shrinking of the conjunctiva during the past five months. In an occasional case of chicken pox the vesicles are so large that they resemble somewhat the bleb of pemphigus so that it is possible that the original illness was pemphigus rather than chicken pox.

*Discussion.* DR. WILLIAM M. BANE said one case of pemphigus was helped decidedly by intensive X-ray therapy, but the same treatment did not help the second eye. The first eye remained useful during the life of the patient.

DR. CHARLES E. WALKER thought pemphigus was characterized by bursting blebs and secondary contraction. This case is one of trachoma and would be benefited by the free use of a collyrium of magnesium sulphate.

DR. WM. C. FINNOFF thought epithelial smears with the wet fixation method examined for inclusion bodies, might establish a diagnosis of trachoma, if found.

DR. WILLIAM SEDWICK said the appearance of the upper lids excludes pemphigus and speaks for trachoma.

DR. E. R. NEEPER treated successfully a case of pemphigus with the Shahan thermophore. The protean manifestations of the disease are characteristic.

DR. GEORGE L. STRADER said that Dr. Hugh Young has treated cases of pemphigus with mercurochrome. This case was given 5 c. c. and finally 20 c. c. of a 1% solution intravenously.

#### **Scleral Rupture, Lens Dislocation, Choroidal Detachment.**

DR. WM. H. CRISP presented a man, aged 58 years old, who had been badly beaten up on December 3, 1925, with severe injury to the left eye. There had been profuse extraocular and intraocular hemorrhage. After the extreme conjunctival ecchymosis and swelling had subsided, and most of the blood had disappeared from the anterior chamber, a large subconjunctival rupture of the sclera became visible about one-third of an inch to the temporal side from the limbus and it also became evident that the lens was dislocated moderately backward. The blood in the vitreous had been rapidly absorbed, but after about nine or ten days there remained in the posterior fourth of the vitreous chamber a bright red, somewhat indistinctly visible mass, covering a large part of the fundus which did not seem to change appreciably from day to day. It was thought that this mass might have represented a choroidal detachment. The eye had remained decidedly soft, and homatropin had been used until December 15th, when atropin sulphate was started. For nearly two days the eye had been distinctly more comfortable under the atropin. In the evening of December 17th, the patient began to have a severely painful attack, glaucomatous in character, except that the tension remained a little below normal, altho the eye was much firmer than previously. After the glaucomatous attack, eserine gave decided relief and it was noteworthy that by repeated instillation the action of the atropin was overcome by that of the eserine within about four or five hours. The vision had been almost completely

abolished since the injury. Another interesting feature of the case was the presence in the anterior chamber, about two days after the injury, and for a period of about twenty-four hours, of a perfectly regular straw-colored, discoid structure measuring about two millimeters in diameter, shaped like a miniature crystalline lens and resting upon the upper inner margin of the pupil. It was suggested that this might have been the remains of a mold of blood clot from which the colored constituents had been absorbed.

*Discussion.* DR. WM. M. BANE thought this case should be observed for a time. The material in the vitreous is probably an organizing clot.

DR. C. E. WALKER said in this sort of case, a dislocated or cataractous lens should be removed.

#### **Toxic Paresis of Left External Rectus.**

DR. GEORGE F. LIBBY reported the case of P. H. L., male, aged 34 years. Last April the patient first noticed lateral diplopia, with inability to rotate the left eye outward. He promptly had a devitalized infected tooth extracted. There was an apical abscess, with erosion of the apex of this tooth. When first examined, on May 21, 1925, there was 32° of esotropia. Vision and the fundus oculi were normal. Examination of the mouth then showed three devitalized, infected teeth and one impacted third molar that was considered suspicious. All four teeth were extracted and the abscess cavities were curetted. In removing the impacted molar the jaw was fractured and had to be wired. Examination of the nose showed an old, bad fracture of the septum, which caused bad drainage from the accessory sinuses. Wassermann and kidney tests were negative.

On May 25th, the esotropia for distance was 24°; June 1st and 10th, 20°; October 20th, 28°; and December 9th and 19th, 15° for distance and 6° for near. No medicines have been given except dilute hydrochloric acid and pepsin for cloudy urine, with excess of phosphates. The septum is to be straightened for drainage.

*Discussion.* DR. F. R. SPENCER thought the case had been thoroly covered and everything had been done.



DR. CHARLES E. WALKER thought potassium iodid or syrup of iodides might hasten recovery.

#### Cases of Congenital Ptosis.

DR. WM. C. FINNOFF exhibited two cases of bilateral congenital ptosis and marked epicanthus in a father and daughter, and reported a third case in the same family of another daughter 4 months old. These are the only children. There are no other congenital malformations and the family history was negative.

DONALD H. O'ROURKE,  
Secretary.

### MEMPHIS SOCIETY OF OPHTHALMOLOGY AND OTOLARYNGOLOGY.

February 9, 1926.

DR. T. F. LEATHERWOOD, Presiding.

#### Persistent Pupillary Membrane.

DR. J. B. STANFORD presented a patient with this condition in each eye. There was one filament across each pupil. Vision in each eye was 20/15. The patient was presented because of the rarity of bilateral persistent pupillary membrane. He said some observer reported 1.7% of patients show persistent pupillary membrane. He is of the opinion that they are less frequent.

#### Lipemia Retinalis.

DR. E. C. ELLETT presented for a second time a patient with this disease.

*Discussion.* DR. A. C. LEWIS said that it was very unusual and he was very glad to see it.

DR. ANTHONY wondered if patient would be living if he had not had insulin treatment.

#### Osteoma of the Orbit.

DR. ARCHIBALD C. LEWIS presented the case of Miss E. M. H., aged 15 years, who was sent to the hospital on January 27, 1925, by Dr. J. B. Stanford. She was complaining of pain and swelling in and behind left eye of several days duration. Vision in this eye was slightly blurred.

Objective symptoms: O. S. marked exophthalmos (about 20 mm.). Upper eyelid was congested, thickened, prac-

tically immovable and covered the whole cornea. Movements of the eye were limited in all directions with no upward rotation. Pupil was normal in size and reaction to light and accommodation. The disc was somewhat congested and the retinal veins slightly engorged. Exact vision was not recorded, but was good and fields appeared normal.

Urine and Wassermann negative. Skiagraphs of the frontal region show a round tumor mass about 2 inches in diameter in the posterior and upper nasal side of the orbit, including the posterior ethmoids and extending beyond the median line of the nasal cavities. Intranasal examination showed a complete obstruction of the upper half of left nasal chamber. On the right side the upper part of nasal septum was pushed well to the right.

On February 2nd, under ether anesthesia, the growth was removed. The Killian frontal sinus incision was made, the orbital periosteum and contents dissected downward and a hard bony mass exposed in the back of the orbit. With chisel and mallet a large opening was made into the nose as is done in the Lynch sinus operation. We were then able to break the bony growth with chisel into several pieces and remove it all. (Specimen was shown.) This opened up the floor of the frontal sinus. A rubber drainage tube was passed into the nose and the external wound was completely closed as in a frontal sinus operation.

The patient had good ocular movements; no diplopia; fundus appeared normal and her vision apparently so.

*Discussion.* DR. STANFORD said he saw the patient and did not know whether it was a tumor or abscess, but he thought it was a sarcoma. He complimented Dr. Lewis on the beautiful result.

#### Trachomatous Keratitis.

DR. ARCHIBALD LEWIS presented Mr. R. B., aged 21, on whom he had performed canthotomy for chronic trachoma with keratitis, ulceration and pannus.

The patient entered the hospital Jan. 31, 1926. He complained of pain in the left eye, lacrimation and severe

photophobia. He was in the hospital last fall for one month with the same trouble and has had frequent attacks of this kind during past two years.

His lids were thick and rough, the palpebral fissures so narrow that the eyes could only be opened about 15 mm. The orbicularis muscles were so strong and spastic it was hard to force the lids open and any effort to do so caused prolonged sneezing.

Under the treatment of atropin, dionin and silver nitrate the symptoms were improving.

Yesterday under local anesthesia, a canthotomy was done on each eye for relief of the orbicularis spasm and pressure, with hopes of giving him permanent relief.

*Discussion.* DR. ELLETT said nothing helps these patients so much as a canthoplasty; dividing the external canthal ligament is essential. He mentioned the description of the operation in Dr. Ziegler's papers, read before the last meeting of the A. M. A.

#### **Traumatic Ulcerative Keratitis.**

DR. ARCHIBALD C. LEWIS presented Mr. W. C. H., aged 60 years. He entered hospital Jan. 27, 1926, with history of blow on left eye three weeks previously. The eye gave little trouble for a few days, but pain had been very severe for past week. Photophobia, lacrimation were marked. There was a small ulcer surrounded by a much larger infiltrated area in the pupillary region; deep ciliary injection and acute conjunctivitis.

Blood was negative for lues and malaria; urine negative. Under atropin, dionin, mercurochrome, argyrol and hot compresses the eye improved. On January 31st, he received a 5 c. c. injection of cow's milk, with some improvement. This was repeated on February 3rd and produced no reaction and no improvement. On Feb. 5th and February 8th, he received 10 c. c. with a distinct improvement in both subjective and objective symptoms. The eye is now almost well.

#### **Intracocular Tumor.**

DR. E. C. ELLETT reported four cases. These cases are not common and these four were reported because they all came under observation within a few weeks.

Case 1. W. Z., a white man, aged 62, was referred by Dr. M. H. Bell of Vicksburg, with a diagnosis of retinal detachment, probably due to tumor. The vision in the right eye was blurred for about two months and the eye was almost blind. The retina was detached below, the detachment appearing as two distinct lobes. The temporal one gave a reddish reflex thru the retina and moved with the movement of the eye. The nasal one reached up high enough to obscure the disc and was dark and apparently not movable. Transillumination of the eye gave a shadow when the light was placed at the lower nasal quadrant. Eye enucleated January 28th. Specimen showed a large brownish tumor, white on section, filling the lower nasal quadrant. The gross appearance was that of a leucosarcoma. O. S. Normal.

Case 2. J. R. M., a white man, aged 45, gave an indefinite history of failing vision for some months. In July, 1925, a pterygium was removed by another doctor from O. D. It bled freely. The vision was not tested nor the eye otherwise examined at that time. On January 17th, he says "something popped" in O. D. and the vision had been practically gone since then. It was little better than p.l. on January 23rd. O. S. normal. O. D. showed a retinal detachment below extending all the way across. The temporal half was gray and wavy. The nasal half was underlaid by a smooth dark mass, well forward. A dark reddish yellow mass could be seen by oblique illumination and the same area down and in was dark to transillumination. January 30th, enucleation. Specimen shown. There was a pigmented tumor about 10 mm. in diameter springing from the ciliary body down and in. Retina detached over growth and also down and out. Probable diagnosis melanotic sarcoma.

Case 3. W. P. M., a white man, aged 37. In September, 1923, he said the right eye went out suddenly. He was completely blind in that eye with no symptoms and no apparent cause. In three months the sight had returned, but in September, 1925, it again failed. He was recently seen by Dr. B. S. Guyton of Oxford, who diag-

nosed retinal detachment. For two days the eye had been red and painful. The left eye was normal. O. D. ciliary injection, cornea hazy, no reflex obtainable. T. 45. Pupil dilated and inactive, not influenced by eserine. No shadow was seen by transillumination. Tumor, with secondary glaucoma (2nd stage of tumor) was diagnosed and enucleation advised. He returned to Dr. Guyton, who enucleated the eye, and reported that it contained a tumor.

Case 4. Mrs. F., aged about 50, came from the eastern part of the state with a history of a blurring of the nasal field of the left eye for three weeks. She has always been near sighted and with correction she had vision 20/25 mostly, and 20/25 +. She had high blood pressure but was otherwise well. O. D. normal, 4 D. myopic. O. S. 5.50 D. myopic. The eye was otherwise normal except for a circumscribed retinal detachment temporal to the macula. The lower and inner edge

of the detachment rose steeply from the surface of the eye ground—was in folds, but not movable. Above and out the limits of the detachment could not be seen. There was a tear in the retina to the outer side. The top of the detachment was best seen with + 6 sph. A month later vision 20/60, top of detachment + 12, transillumination negative, pupils equal and active, field more involved. A tentative diagnosis of tumor was made and enucleation of the eye is the probable outcome.

*Discussion.* DR. J. B. STANFORD said last case looked like retinal detachment without tumor, but the steep detachment would suggest tumor.

DR. D. H. ANTHONY said he had seen these cases and that the detachments appeared dark with ophthalmoscope where the tumor was behind the detached retina and were lighter when only fluid was present.

P. M. LEWIS, Secretary



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## DIAGNOSIS OF GLAUCOMA

There probably is not a single ophthalmic surgeon of large experience who has not, at some time, slipped up on the diagnosis of glaucoma. Mistakes, presumably, should never occur, but they only go to demonstrate the vulnerability of the most careful. It this can happen to those who are fully equipped by education, training and careful systematic routine methods, it is most convincing proof that the average ophthalmologist must be constantly on the lookout for the mere possibility of the presence of glaucoma.

Optic nerve atrophy should never be diagnosed until the contingency of glaucoma has been excluded. There are many things which may make this difficult, central opacity of the lens accompanied with small pupil being one example, where the resulting blur of the nervehead can obscure an undermined cup. Nor can the field of vision always be depended upon to throw light on the subject. Only recently a case, under observation for recurrent retinal hemorrhages, developed a rise of tension with no demonstrable flanging of the physiologic cup, and with a most minute search for field defects yielding negative results.

Regard for the peculiar transient

character of the tension rise, with attending symptoms, must also be remembered. We can recall an instance where a patient consulted an ophthalmologist during a mild attack of glaucoma, which responded promptly to mild treatment. This patient shortly after consulted one of the leading ophthalmologists in America, who, after a most critical and painstaking examination, expressed the belief that the patient was not affected with glaucoma, and, in his opinion, never had had a glaucomatous attack. A few days later, while on the train bound for home she suffered a most violent attack of acute glaucoma, requiring operation and resulting in almost complete loss of vision in one eye and some impairment of the other.

The diagnosis of the presence of glaucoma once being made, the question as to advisability of operation arises. There is still a wide diversity of opinion and need for discrimination in this respect. There are those who are of the opinion that every case of glaucoma should be operated upon, as soon as the diagnosis has been made. Other authorities prefer using palliative measures, to be continued as long as the disease can be kept in abeyance. There is one contingency, in which all should concur. Where it has been ob-

served that either the fields of vision, tension, or central vision can no longer be controlled by drugs, operation should be urged in an effort to save what remains. Unfortunately this advice is not always given early to the patient, many cases of blindness resulting, which might have been avoided.

M. W.

### PRIMITIVE VISION.

Primordial, basic, or primitive vision has been referred to by Parsons, in his Bowman Lecture given last year before the London Convention of English Speaking Ophthalmological Societies as "protopathic," a word meaning in physiology, "of primary or direct experience." It is the kind of vision which is possessed by man in common with the lowest vertebrates, the power in living tissue to respond to light; and, if not identical with the power of plants to react to light, is very similar to that basic manifestation of vegetal life.

It is contrasted by Parsons with "epicritic vision," that is vision reviewed, estimated, critically discussed, raised into consciousness and affecting consciousness—the kind of vision we know and talk about—the assemblage of related phenomena that we commonly refer to under the word vision. As Parsons points out, our conscious seeing is based on processes that never rise into consciousness; but belong among the very foundations of physiology, normal and pathologic. They enter into association with fundamental manifestations of other functions—motor, secretory, physical memory and reactions to other stimuli to form combinations, "patterns" Parsons calls them, from and on which other combinations are built up in succession, until at the top we have the conscious seeing—the "epicritic vision" which we speak and think of as "vision," ignoring the deeper, more widely possessed, and more essential processes of which the vision we think about, is only the last manifestation:

The study of primitive vision has an importance far beyond its bearing on theories of light and sight. It lies in the common region of physics, chem-

istry and physiology. The action of light on living matter furnishes an approach to vital problems, of nutrition, elimination, the utilization of waste and by-products. It furnishes tests and methods of investigation for biochemistry and biophysics, as well as histophysiology. The staining of living tissue is a means of investigating primitive functions of the living cell, very close to those that furnish primitive vision.

It is an opportunity to extend our knowledge of cell physiology, and cell reactions to chemic experiments; and by getting a broader base of acquaintance with fundamental changes we will come to understand better the practical problems of fatigue, irritation, tissue reactions and therapeutics that constitute the immediate problems of ophthalmic practice. The kind of vision we can study objectively in the laboratory, the visual response that results in movement and can be made the subject of exact measurement, may be made to answer questions and furnish suggestions of great importance in practice.

E. J.

### ACKNOWLEDGEMENT.

It would be affectation of indifference or stoicism, which the writer does not feel, not to acknowledge the satisfaction given by his friends in the celebration of his seventieth birthday. The volume prepared for the occasion will soon be in the hands of the readers of this JOURNAL, presented by those who made its publication possible. We feel, that to have had any share in stimulating the activities that have resulted in such a volume, ought to be an occasion for gratification. The meeting of the Colorado Ophthalmological Society at which it was presented was in the nature of a gathering of close friends. Even the presence of those coming from other states, and the letters received from friends still farther removed and kept away by the various demands upon them, emphasized the intimate character of the celebration.

There was much of pleasant surprise in it, too. Altho unmistakable allusions to something of the kind had been made to the destined recipient in

Atlantic City, Vancouver and at other distant points, no hint regarding it had come from those in Colorado, or from those who were taking an active part in the preparation for it. No words can thank them for their labors, or for the tactful way in which they were performed.

But the significance of the occasion is, that this plan has been adopted and carried thru by those active in ophthalmic practice and science in America. There will be other occasions, equally appropriate to be so commemorated. There is now a host of workers in ophthalmic science in the two Americas, whose services to humanity in this channel are fully worthy of similar recognition. Life is made richer and the development of science is stimulated, by all honest recognition of good work done, on the part of those who are working with us for a common and worthy purpose. E. J.

#### BOOK NOTICES.

**Transactions of the Ophthalmological Society of the United Kingdom,** Volume 45. Parts 1 and 2, Session 1925. Cloth, octavo, 1082 pages. With 7 plates and 213 illustrations in the text. London. J. and A. Churchill, 1926.

The two "parts" of "volume 45" are really two separate volumes, each larger than the average volume the Society has issued in the past. Last year the scientific sessions of the Annual meeting were merged with the Convention of English Speaking Ophthalmological Societies held in London; the separate meeting being only a business session held in connection with the Convention. The papers and discussions of the Convention, including the Bowman Lecture by Sir John Parsons, occupy the first, and three-fourths of the second "part;" the remainder of the latter being given to the proceedings of the affiliated societies, the Midland, the North of England and the Irish Ophthalmological Societies.

The Address of the President Mr. Treacher Collins deals with "The Elimination of Eye Disease." He

speaks of it as "a few historic facts, with which, aided by a touch of imagination, I ask you to peep thru a hole in the curtain of the present and gaze at some of the wonders that may be."

The Bowman Lecture by Sir John Parsons dealing with "The Foundations of Vision," both because of the character of the subject and the way it has been treated, will yield more to the careful reader than it could have yielded to any listener. Its general trend has been indicated elsewhere in this issue (p. 388).

An interesting and important part of the volume reports the Symposium on "The Evolution of Binocular Vision" participated in by Prof. Elliot Smith, Sir Frederick Mott, Prof. S. E. Whitnall and Sir Arthur Kieth. To read understandingly the collaborated sketch of the factors and process by which binocular vision developed in man is an ideal corrective for the blind devotion to "exercises" and "operations;" that grows upon the practitioner, who day after day has to meet the insistent demands of patients, whose daily living may have departed so far from normal, or whose original neuromuscular organization may have been so defective, that normal binocular vision is quite impossible. The appreciation of this symposium, moved by Sir George Berry and Mr. J. B. Lawford, will be understood by every reader who has read and profited by it.

The individual papers that occupy the bulk of these volumes, are all mentioned in current literature. In general they have the practical character that marks most the Transactions of the British Societies. Of the 103 in attendance from America, 47 took an active part in the proceedings. The 19 papers presented by writers from the United States were generally on subjects their authors had presented in papers, at American societies devoted to Ophthalmology. But for two-thirds of their hearers no risk of repetition existed. The total membership of the Congress was 526, of which 330 were in attendance. We believe that the effort to arrange and hold such a meeting was worth while, and that these volumes are a valuable addition to ophthalmic literature. E. J.



**Bulletins et Memoires de la Société Française d'Ophthalmologie.** 38th Year, 1925. Paper, octavo, 834 pages, 8 colored plates, many illustrations. Published by a Committee of the Society, Paris, Masson et Cie.

This Society has 676 members and 5 honorary members. In addition it receives foreign delegates, of whom the list for 1925, numbered 21. Most of the members live in France; but 6 French colonies furnish 14 members and 38 other countries are represented in the membership; 14 come from England and 11 from the United States. At this meeting, 127 new members were elected.

The 1925 meeting of the French Ophthalmological Society was held as a joint meeting with the Belgian Society, at Brussels. The occasion was made memorable by visits to historic buildings and grounds, artistic entertainments; the presence of the Queen of Belgium, daughter of the famous Bavarian oculist Duke Karl Theodor, at the opening session, and the opportunity to visit Cardinal Mercier. The account of these events and the addresses at the opening session occupy 30 pages containing much of historic interest.

Each year the business committee suggests a list of topics from which one is selected by the Society, to be the subject of a report to be made two years later. Such a report was made by Prof. F. Lagrange of Bordeaux, on the Treatment of Infantile Glaucoma. The Reporter is chosen by the Committee after the special subject has been selected by the Society. Under these conditions, a writer especially interested and familiar with the subject, with two years to prepare the report, makes it a monograph of importance in the literature.

This one by Prof. Lagrange is no exception. It occupies 195 pages of the volume, is illustrated by 3 colored plates, showing anatomic conditions, chiefly of the filtration angle; and 47 figures in the text showing the different operations that may be practiced for this condition, from buttonhole iridectomy to removal of the anterior segment of the eyeball. The conclu-

sions arrived at, refer to the etiology and mechanism of this form of glaucoma; the indications for each particular form of treatment; and the prognosis of infantile glaucoma. The bibliography, arranged alphabetically by authors' names, occupies 9 pages.

A second report of complementary character, by Prof. Gallemaerts of Brussels, deals with Infantile Glaucoma and the Slitlamp. It was followed by a discussion of both reports by 11 French, Belgian, Swiss and Italian Oculists, whose names are familiar to readers of current ophthalmic literature thruout the world. The report and discussion occupy 32 pages. The remaining 54 papers and the discussions on them require 535 pages. Citizens of more than 20 countries participated in this meeting. The presiding officers at the different sessions were: Gallemaerts of Brussels, Belgium; Lawford of London, England; Marquez of Madrid, Spain; Bousquet of Montreal, Canada; and Borel of Neuchatel, Switzerland. It could well be called an assemblage of French speaking ophthalmologists from all parts of the world. Its transactions are among the most notable relating to ophthalmology of the year 1925.

E. J.

**Bulletin de la Société Belge d'Ophthalmologie.** No. 51. Paper, 8 vo., 102 pages, 16 illustrations. Brussels, Imprimerie Médicale et Scientifique, 1925.

The fiftieth meeting having been held conjointly with the Société Française, the fifty-first meeting of this society was held in Brussels, November 29, 1925. The society includes 111 active members, of whom 48 were in attendance, 21 associate and 9 honorary members. The bulletin contains the 15 communications read before the society, with notices in memoriam of three deceased members. minutes of the proceedings of general interest and a table of contents, but no alphabetic index.

The longest paper, by F. Benoit of Liège, deals with the angle of the anterior chamber as the organ of elimination of the aqueous humor. It occupies almost 15 pages but about one-

third of this space is given to illustrations. Two of the authors of papers appear not to be members. One of these papers by Mademoiselle Claes, deals with the practice of Refraction in the United States. This author finds, in most important respects, it is similar to the practice in Belgium. In these respects, it seems to differ: 1. The systematic use of cycloplegics. 2. The careful objective determination of refraction. 3. The determination of the muscle balance. Dr. Kleefeld of Brussels has contributed two papers. The one on biomicroscopy of the cornea records observations on persistent central edema of the cornea, poisoning of the cornea by podophyllin and corneal changes following scleritis. The papers are generally clinical in character, some of them merely reporting cases.

At the opening session of the meeting, the Secretary, Dr. Van Duyse of Gand, read on behalf of the members, an address of thanks and appreciation to Prof. E. Gallemaerts of Brussels, who briefly acknowledged the honor accorded him. E. J.

**Die scheibenformige Entartung der Netzhautmitte.** (Degeneratio Maculae Luteae Disciformis) Dr. Paul Junius and Geheimrat Dr. Herman Kuhnt, Professors in the University of Bonn. Cloth, 8vo., 140 pages, 42 illustrations in the text, 22 in colors, Berlin S. Karger, 1926. Price 21 marks.

This is practically an atlas of illustrations with explanatory text, constituting a monograph on certain degenerative pathologic conditions of the posterior polar region of the eyeball, particularly as they are observed with the ophthalmoscope. The foreword is signed by both authors. Then an added line signed by Prof. Junius tells of the death of Prof. Kuhnt on October 31 of last year.

The first 34 pages are devoted to an introduction and historical review of the subject, illustrated by 7 reproductions in black and white of pictures from the atlases of Oeller and Pagenstecher and Genth and the article by Michel in Graefe's Archiv. Then come

reports of 8 cases observed by the authors; abundantly illustrated, mostly by colored plates of the fundus, of high excellence. Then is given a general summary of conclusions, based on these cases and the earlier literature, 21 pages; and then 20 pages on this disc form degeneration of the macula and "retinitis circinata" illustrated by two original cases.

For the practical ophthalmologist, interested in clinical observations and the diagnosis and treatment of disease, this monograph will be very interesting. It should find a place in every working library of ophthalmology. If, with these illustrations, it could be published in English, its practical character would appeal to a wide circle of interested readers. E. J.

**"Ears and The Man; Studies in Social Work for the Deafened."** By Annetta W. Peck, Estelle E. Samuelson and Ann Lehman. Introduction by Wendall C. Phillips, M.D. 207 pages. F. A. Davis Company, Philadelphia.

This little book is so human in its appeal and advice, that it is startling. These three women, the authors, are themselves deafened, and are the first thus handicapped to enter the field of professional social work for the deafened. This handicap gives them a most keen comprehension of the problems, personal and environmental, which the deafened individual must meet.

The deafened are classified as to possibility of being helped, lip reading is clearly defined and discussed, and the harmfulness of putting certain children in deaf schools is pointed out. This text sets forth the history of social organizations and institutions for the deafened and predicts a brilliant future in this direction. This book is monumental. It should be read by every otologist, deafened individual, or by anyone else interested in this phase of social work. It is a good book for the waiting room of an otologist's office.

Should the authors rewrite this work, the suggestion is offered that all slang phrases be omitted, as in a few years these become unreadable.

J. H. HARTER.

## CORRESPONDENCE.

Credit Omitted.

*To The Editor:*

My paper on "Some Essentials of Glioma of the Retina," which was published in the March issue, was substantially the same as given at the 1925 session of the Indiana State Medical Association. Thru an error on my

part, proper credit was not given, when it was published in the A. J. O.

My apologies are due and are tendered to the Editor of the official JOURNAL, and to the members of the association. I also tender my apology to you for submitting an article without protecting the A. J. O.

C. W. RUTHERFORD.

*Indianapolis, Ind.*

## ABSTRACT DEPARTMENT

Reprints and journal articles to be abstracted should be sent to Dr. Lawrence T. Post, 520 Metropolitan Building, St. Louis, Mo. Only important papers will be used in this department, others of interest will be noticed in the Ophthalmic Year Book.

**Coppez, H. and Davis, M. Angioid Streaks in the Retina.** Arch. d'Ophthalmologie, 1925, vol. 42, pp. 649-661.

The authors have had the unusual opportunity of observing this rare disease in one patient over a period of more than twenty-five years. The first observation showed a vascular ring about each papilla with no other retinal abnormality. Seventeen years later the patient returned complaining of a central scotoma in the right eye. In the macula there was granular pigment. The vascular ring was less well defined and narrower and less distinct. The vessels were dark brown and broken up. Two months later little gray areas appeared in the macula followed quickly by the fusion of these in the form of an elevated plaque. The surrounding retina was edematous. A year later some deep hemorrhages surrounded the exudate. At this time a few punctuations appeared in the left macula. Five years later, the left eye had followed the right.

The authors regard the process as a very chronic inflammation of the posterior pole of the eye. This causes vessels otherwise not seen to become congested and visible, especially the circle of Zinn, in somewhat the same manner as the pericorneal vessels become prominent in inflammations of the cornea. The disease advances from the external coats of the eye to the internal, terminating in an exudative inflammation of the macula.

Two other cases are reported in less detail and the literature discussed. Three excellent colored plates and a

number of black and white illustrations accompany the text. L. T. P.

**Offret. New Treatment of Ophthalmia Neonatorum by Local Use of Antigonococcic Serum.** Soc. Méd de Paris, Oct. 20, 1925. Abst. Gaz. des Hôp., 1925, vol. 98, p. 1567.

In five cases, the inflammatory phenomena disappeared in 24 hours, and the infants were definitely cured in 4 to 6 days. The treatment consisted in almost continual instillations of the antigonococcic serum of Blaisot.

C. L.

**Raybaud, A. Cerebral Localization.** Gaz. des Hôp., 1925, vol. 98, p. 1677.

The author discusses sensorial optic localization. The principal center of sight is the calcarine fissure; the secondary is the 5th and 6th occipital convolutions. Patients with circulatory or traumatic troubles in this region have sudden sensations of light, usually red, which cross the visual field and quickly disappear. If the lost vision returns partially, these sensations reappear with increasing distinctness as the vision reestablishes itself. Complete destruction of both hemispheres produces a psychic blindness, which is different from blindness of peripheral origin in that the patient perceives light but not form, for example, he has word blindness. Every point on the retina has a projection on the cortex of the occipital lobe, but authors differ as to the projection of the macula. Ideas of space depend on the integrity of the occipital lobe. Authors disagree as to whether there is a cen-



ter for color. Wilbrand claims there are 3 cortical layers:

(1) A superficial layer, the center for color vision.

(2) A middle layer, the center of visual acuity in connection with form and space sensation.

(3) A deep layer, the center for the sense of light.

The most recent investigations seem to prove that the centers for light and color coincide.

C. L.

**D'Alessandro, Adolfo. Autoblepharoplasty.** La Semana Medica, Buenos Aires, 1925, Dec. 17.

The author considers: (1) The French method of blepharoplasty with a pedicle; (2) the Indian method, which differs in that the pedicle is twisted and torsion made; (3) the Italian method of a pedicle from the arm, and (4) the transplantation of thick dermal free grafts (Wolfe). He does not use Thiersch grafts, or the French method of many small transplantations. He describes a number of cases and shows photographs of cases before and after operations. His general conclusion is that blepharoplasty by a cutaneous method with a flap is the best. His second choice is free grafts taken from other parts of the patient's body. The transference of free grafts from the father or mother, or from some other person—heteroplasty—rarely gives good results, as the grafts usually become gangrenous. He likes best to take the free grafts with a little fat from the underside of the arm. The graft should be much larger than the place to be covered. He operates with local anesthesia by subdermal injection of cocain solution. The results of his work upon the eyelids and the orbit, as shown by the photographs, are very favorable.

H. V. W.

**Osborne, O. T. Eyestrain.** Medical Journal and Record, 1925, Dec. 2.

The almost forgotten art of carefully obtaining the personal history of a patient should be redeveloped and with eyestrain, the physician's duty does not end at the oculist's office. The physician must know the glasses are right, that the frames are properly adjusted, and that the patient is benefited. Then his duty is to caution that

glasses out of adjustment will again cause the same symptoms, or some modified form of the previous symptoms to develop.

The following questions may be used for developing the relation of the eyes to the disability:

1. At what age did the headaches first occur?

2. What is the frequency of the attacks of headache, and what is the exact work or play after which they occur?

3. What is the time of day at which the headache develops, especially the relation of the headache to arising in the morning, or to the work or pleasure of the evening before?

4. What is the relation of the headache to close eye work? What is the relation of the headache to an evening at the theatre, or at the moving pictures?

5. Whether or not the person has a growing dislike for reading, sewing, playing cards, shopping, crowds, parades, ball games, trolley riding, train riding, automobiling, theatres and moving pictures.

6. Whether there is a history of car sickness.

7. What are the associated symptoms of the headache, as anorexia (or often the reverse, several hours before the headache a craving for food), or nausea or vomiting?

8. How soon after vomiting does the headache cease, and is the patient soon able to eat a good meal? Such an immediate appetite is of frequent occurrence, and completely rules out acute indigestion, or an acute stomach disturbance. The reflex indigestion that is caused by the eyestrain may allow food to remain in the stomach and be vomited hours, even twelve or more, after it has been ingested.

9. Whether or not there are any heart symptoms with the headache? Some eyestrain patients have waves of nausea and sensations of fainting. They often have palpitation, and have, or imagine they have heart pains.

10. Whether or not there is insomnia? Many patients can not sleep, lose appetite and weight, and are supposed to suffer from so called nervous exhaustion, with headaches and insomnia as important symptoms.

11. Whether or not there is history of dizziness? Some patients with eye-strain have queer spells, become dizzy and faint on the street or walk side-wise. Such cases have been cured by correct glasses after long, previously unsuccessful, treatment of all kinds.

12. Bifocal lenses may be inappropriate for the individual, especially when he is out and about. Many a patient can not drive a car while he is wearing bifocal lenses, or can not use them for his daily work. The magnifying lenses of the bifocals may be misplaced; they are too high or too low, or too strong for middle distance work. Two strengths of bifocals frequently must be given if the person is to be comfortable and symptomless. One bifocal should be of the proper strength for reading, and the other for middle distance use of the eyes.

H. V. W.

**Duke-Elder, W. S. Osmotic Therapy in Glaucoma.** Brit. J. Ophth. 1926, January, v. 10, No. 1.

Four case histories are recorded; a chronic glaucoma, a subacute, an acute and one resulting from trauma. Following intravenous saline injections, tension fell within an hour and remained down for about a day or two. The traumatic case remained down for some months. The author injects 50 c.c. of a 30 percent solution of salt, slowly and evenly over ten minutes. The patient is placed in a recumbent position and the solution injected by means of a needle, rubber tube and funnel. While there is no contraindication to a second injection, the treatment being transitory, the exhibition of salt by the mouth in cachet might be considered.

The dangers of hypertonic injections are sudden drop in blood pressure and dehydration of tissues. The first is avoided by injecting slowly, the second can be combated by free administration of fluid.

The indications for osmotic therapy are: to tide over acute cases; as a preliminary to operation in cases made difficult owing to vascular congestion; in certain cases of iritis with elevated tension; as an aid to diagnosis in cases with clouded cornea and as a possible aid to therapeutics.

D. F. H.

**Duke-Elder, W. S. The Reaction of the Intraocular Pressure to Osmotic Variation in the Blood.** Brit. J. Ophth., 1926, January, v. 10, No. 1.

This contributor's investigations are dealt with under five headings: introduction; experimental technic; anisotonic injections, (a) hypotonic, (b) hypertonic; mechanism of action and conclusions.

Henderson and Starling's statement that "the production of intraocular fluid is strictly proportional to the difference in pressure between the blood in the capillaries of the eyeball and the intraocular fluid," in the light of the present investigation must be modified, since it is seen that the pressure in the eye, while influenced by the pressure in the blood stream, can vary quite independently of it.

(1) The intraocular pressure is maintained and varied by three factors (neglecting the influence of external pressure):

(a) The physiologic partial impermeability of the lining cells of the eye.

(b) The hydrostatic blood pressure in the capillaries of the ocular circulation.

(c) The osmotic pressure of the blood and of the ocular contents.

(2) The physiologic partial impermeability of the endothelial cells maintains normally a pressure in the intraocular fluids of 10 mm. of mercury. This pressure component is maintained without regard to changes in the hydrostatic pressure of the blood, but it may be overcome by osmotic changes therein.

(3) Experimentally, the influence of the first factor is seen in the pressure decrement in the excised eye. The relation of the intraocular pressure to the blood pressure has long been recognized in the laboratory. Pressure variations caused by osmotic influences have now been demonstrated.

(4) Pathologically, a lowering of intraocular tension due to a diminution or abolition of the partial impermeability of the lining cells of the eye is seen as a result of the solution of the continuity of the endothelial layer that occurs physiologically in long continued moribund states (for ex-

ample, the hypotony of typhus) or that occurs anatomically after trauma, induced either accidentally, or therapeutically in a trephining operation, in which the filtering nature of the scar depends on the failure in the formation of an endothelial lining on its inner surface.

The part played by the general blood pressure in the explanation of pathologic tension states has been tried and found wanting: that played by the capillary pressure is still virtually an unknown quantity. The physiology of the capillary vasomotor mechanism is still in its infancy, but recent investigations (Krogh) on its response to mechanical stimuli, to changes in the osmotic and hydrogen ion concentration of the surrounding media, and to the action of the hormones elaborated by the endocrine glands, are full of significance.

D. F. H.

**Icard. The Nasolacrimal Canal from a Medicolegal Standpoint.** Soc. de Path. Comp., 1925, Dec. 8. Abst., Gaz. des Hôp., 1926, v. 99, p. 171.

At birth, the canal is obstructed by a mucofatty layer which does not disappear until the second or third day. In case of infanticide, this impermeability is an argument in favor of the accused mother. But, on the other hand, in cases where it is proven that the child has lived less than one day,

permeability constitutes a presumption of infanticide by mechanical means which violently prevent the passage of air into the lungs.

C. L.

**Beauvieux and Ristich-Goelmino. The Blood Supply of the Cortical Representation of the Macula.** Arch. d'Opht., 1926, Jan. No. 1, pp. 5-19.

An explanation of the retention of central vision in bilateral cortical hemianopsia is offered in the collateral circulation in this cortical area, produced by anastomosis of the middle and posterior cerebral arteries which exist in this limited region only. These vascular connections are demonstrated by injection of ten brains.

The posterior extremity of the calcarine fissure (the cortical center for the macula) receives its blood supply by three routes. 1. The calcarine artery. 2. The posterior temporo-occipital artery. 3. The artery of the cuneus. Fine anastomoses exist between these arteries so that destruction of any one branch is compensated. If the entire posterior central artery is blocked on each side, the visual fields outside of a 2° radius from the center are destroyed, but the collateral circulation from the Sylvian artery (from the middle cerebral) maintains the nutrition of the macular cortex and central vision is retained.

L. T. P.

## NEWS ITEMS

Personals and items of interest should be sent to Dr. Melville Black, 424 Metropolitan Building, Denver, Colorado. They should be sent in by the 25th of the month. The following gentlemen have consented to supply news from their respective sections: Dr. H. Alexander Brown, San Francisco; Dr. Wm. Thornwall Davis, Washington; Dr. Gaylord C. Hall, Louisville, Ky.; Dr. George F. Keiper, LaFayette, Indiana; Dr. J. W. Kimberlin, Kansas City, Mo.; Dr. George H. Kress, Los Angeles; Dr. Edward D. LeCompte, Salt Lake City; Dr. W. H. Lowell, Boston; Dr. G. Oram Ring, Philadelphia; Dr. Charles P. Small, Chicago; Dr. G. McD. VanPoole, Honolulu.

### DEATHS.

Dr. Sigismond Spierer of Trieste died September 24, 1925.

Dr. Joseph O. Stillson, Indianapolis, aged seventy-five, died January 28th.

Dr. Nils E. Remmen, Chicago; aged sixty-two, died of leucemia, February 28th, at Fair Hope, Alabama.

Dr. Thomas S. McDavitt, St. Paul, Minnesota; aged sixty-nine, died March 3rd, of myocarditis, from which he had been a sufferer many years. He was trustee of the

American Medical Association, continuously since 1913.

Dr. George F. Keiper, LaFayette, Indiana; aged fifty-nine, died March 18th. Dr. Keiper was a valued member of the news reporting staff of this Journal. He was a member of the national and local societies as well as the Chicago Ophthalmological Society.

Dr. Thomas R. Pooley, Newton, New Jersey; Bellevue Hospital Medical College, New York, 1864; formerly professor of oph-



thalmology, Starling Medical College, Columbus and New York Polyclinical Medical School and Hospital; Civil War veteran; on the staff of the New Amsterdam Eye and Ear Hospital, New York, 1888-1910; aged eighty-four; died February 14th, of chronic interstitial nephritis and uremia.

#### SOCIETIES.

Dr. John M. Wheeler has been elected president of the New York Ophthalmological Society; Dr. Francis W. Shine, vice-president; and Dr. John H. Dunnington, secretary-treasurer.

Dr. Beverley R. Wellford, Jr., has been elected president of the Richmond Ophthalmological and Otological Society; Dr. Alvin F. Bagby, vice-president; and Dr. Francis H. Lee, secretary-treasurer.

The Tulsa Academy of Ophthalmology and Oto-laryngology at their annual election, March 15, 1926, chose the following officers: President, Dr. J. Franklin Gorrell; vice-president, Dr. Chas. H. Haralson; secretary and treasurer, Dr. W. A. Huber.

The Ophthalmological Section of the New York Academy of Medicine has recently elected the following officers for 1926: President, Dr. C. E. McDannald; secretary and treasurer, Dr. Thomas H. Curtin.

At the meeting of the Kansas City Eye, Ear, Nose and Throat Society, March 13th, 1926, an eye clinic was conducted by James M. Patton of Omaha, Nebraska, and an Ear, Nose and Throat Clinic by Dr. Harry Baum of Denver, Colorado.

The section of ophthalmology of the New York Academy of Medicine presented the following program for March: a. A Stereoscope for Tangent Screen Examinations, A. Milton Goldman (by invitation); b. A Simplified Scotometer with Suggestions for Field Taking, A. H. Thomasson (by invitation); Discussion, Alexander Duane; c. Discussion of Scotoma Caused by the Retinal Blood Vessels, John N. Evans (by invitation); Discussion, Ralph I. Lloyd (by invitation).

The Chicago Ophthalmological Society presented the following program at the regular monthly meeting in March: Endophthalmitis Phacogenetica, by O. G. Nugent; Study of Coloboma in Rabbits, Experimentally Produced, by Frederick A. Davis; Lethargic Encephalitis. Entrance Thesis by M. L. Folk.

On Friday evening, February 26th, the Ophthalmological and Oto-Laryngological Section of the Cleveland Academy of Medicine held its regular meeting at Hotel Winton. The meeting was well attended and proved instructive and entertaining. The program for the evening consisted of a symposium on "The Nasal Accessory Sinuses." Dr. M. R. Kendall took up "The History and Anatomy." Dr. A. L. Stotter presented "The Pathology, Symptomatology, Diagnosis and Non-Surgical Treatment." Dr. J. W. McCall covered "The Surgical Treatment of Sinuses." Dr. J. H. Ralston showed "The Relationship of Sinuses to Ocular

Diseases." Dr. W. C. Hill took up "The Interpretation of Roentgenograms," showed many rare and difficult X-ray films, and explained why misinterpretation is certain to occur at times. The discussion was opened by Justin Waugh and was followed by Drs. Wm. B. Chamberlin, M. Metsenbaum and A. D. Ruedemann.

The Section on Ophthalmology of the College of Physicians of Philadelphia, at the meeting of January 21st, appointed Dr. Edward E. Shumway, Chairman; and Dr. Leighton F. Appleman, Clerk, for the ensuing year. Dr. G. E. deSchweinitz, Dr. William M. Sweet, and Dr. J. Milton Griscom were appointed as the Executive Committee. The Scientific Program at this meeting consisted of an "Exhibition of a Case of Sudden Blindness Following Trauma," by Dr. Warren S. Reese; a "report of an Unusual Case of Macular Edema," by Dr. Luther C. Peter; a report upon "The Pupiloscopic Findings in Lesions of Different Parts of the Reflex Arc," by Dr. Francis Heed Adler; the "Presentation of a Set of Couching Needles, with an Historical Sketch," by Dr. Hunter H. McGuire, of Winchester, Virginia; and an historical sketch upon "Sir William Lawrence in Relation of Medical Education with Special Reference to Ophthalmology in the Early Nineteenth Century," and the presentation to the College of an Ophthalmoscope used by Dr. William F. Norris by Dr. Burton Chance. At the February meeting of the Society the following program was presented: Dr. Paul J. Sartain, "A Memoir of Dr. S. Lewis Ziegler;" Dr. J. Milton Griscom, "A Case of Angioid Streaks in the Retina;" Dr. William Zentmayer, "A Case of Family Nodular Degeneration of the Cornea;" Dr. Edward A. Shumway and Dr. A. R. Renninger (by invitation), "Exhibition of a Case of Microphthalmus with Orbital Cyst;" Dr. Charles R. Heed, "Mott's Operation for Ptosis;" Exhibition of case.

#### PERSONALS.

Dr. Frank Allport of Chicago has been spending the past two months in Miami.

Dr. Harry V. Wurdemann, Seattle, has been commissioned Colonel of the Medical Reserve, United States Army.

Dr. George Swift of Seattle was a San Francisco visitor during the early part of March.

Dr. Jeffrey J. Walsh, Providence, has been elected president of the Rhode Island Ophthalmological Society.

Dr. Thomas B. Holloway of Philadelphia addressed the Atlantic County Medical Society, January 8th, on "The Orbit from the Standpoint of the General Practitioner."

Dr. Victor Ray, Sr., Cincinnati, has been appointed head of the department of ophthalmology of the University of Cincinnati College of Medicine to succeed Dr. Robert Sattler, resigned. Dr. Sattler was made emeritus professor of ophthalmology. Dr. Ray became assistant to Dr. Sattler in 1899, assistant clinical professor in 1909, and professor in 1916. He is also assistant director

of the ophthalmologic service at the Cincinnati General Hospital and chief clinician in the outpatient department.

On the evening of March 30th, Dr. Edward Jackson was given a dinner, in celebration of his seventieth birthday by the Colorado Ophthalmological Society at the University Club, Denver. The guests present were Drs. Post, St. Louis; Patton, Omaha; Lichtenberg, Kansas City; Bribach, Atchison, Kansas; and Robertson, Concordia, Kansas. Letters and telegrams in large numbers were received by Dr. Jackson from friends and colleagues in all parts of the country. He was presented with a Memorial volume "Contributions to Ophthalmic Science," edited by Drs. deSchweinitz, Duane, Feingold, Bedell, Crisp and Finnoff. This volume was financed by two hundred and ninety of his ophthalmologic admirers. A complimentary volume will be presented to each subscriber of the American Journal of Ophthalmology. Dr. Black presented to Dr. Jackson a dagger and stylus worn by a physician of Ceylon, India, in the fifteenth century with the compliments of the donor, Dr. Casey A. Wood. The speakers at the dinner were loud in their praise of Dr. Jackson's scientific attainments, his standing as a teacher and example as an ophthalmologist. He replied with emotion when, in his closing remarks, he thanked everyone for the honors so graciously tendered him.

#### MISCELLANEOUS.

An examination of 837 freshmen of the University of Kentucky recently disclosed defects of vision in 438 individuals.

The Library Committee of the A. W. Calhoun Medical Library, Emory University, Atlanta, Ga., is collecting book plates of medical libraries and of representative men in medicine. Two copies of book plates with a few lines of explanation will be highly appreciated.

The Council of British Ophthalmologists has issued a report on the education of children having defective vision. It considers that special educational facilities are required for those having vision so low that they are unsuited for ordinary school education.

A second "Slit Lamp Course" on the "Microscopy of the Living Eye" was given at Lakeside Hospital, Cleveland, O., recently by Professor Leonard Koepe of the University of Halle, Germany. The course consumed two weeks, three hours daily being given over to lectures and practical demonstrations. The Clinical material was taken from the ophthalmologic services of Drs. W. E. Bruner and R. B. Metz of Lakeside Hospital.

Arrangements have been made for two intensive courses in the Diagnosis and Treatment (including surgical) of Anomalies of the

Ocular Muscles, to be given by Doctor John H. Dunnington of the Department of Ophthalmology, University and Bellevue Hospital Medical College. Fee \$75. Each class is limited to eight members. First Course—April 5th to April 17th inclusive, Daily 4-6 P.M. Second Course—April 19th to May 1st inclusive, Daily 4-6 P.M. Applicant should state preference for the first or second course. Correspondence should be addressed to Dr. John Wyckoff, Secretary, University & Bellevue Hospital Medical College, 338 East 26th Street, New York.

The bequests this month to ophthalmologic institutions are unusually numerous. The New York Guild for Jewish Blind was left \$50,000 under the will of the late Mrs. Hannah Heyman, New York; the New York Eye and Ear Infirmary, \$5,000 by the late Dr. Dwight W. Hunter; the New York Ophthalmic Hospital, \$7,500 by John McCaffery; St. Joseph's Home for the Blind, Jersey City, \$1,000 by the will of Nellie Lynn, Philadelphia; the Blind Asylum, Philadelphia, \$92,000 by Amanda J. Leslie; the Memorial Home for the Blind and the Perkins Institution for the Blind, each \$5,000 by David Hale Fanning, Worcester, Massachusetts; and the Manhattan Eye, Ear and Throat Hospital, \$5,000 by Gustav Ulbricht, \$5,000 by Margaret Elizabeth Griffith and \$7,500 by John McCaffery.

The following are the assignments of Oculists to the various Paris hospitals for 1926-1927:

Hôtel-Dieu. Prof. Terrien; assistant, Prêlat; associate, Chapuis; chief of clinic, Cousin; associate chief of clinics, Weil, Ostwald; interns, Dolfus, Renaud; externs, Grintzesco, Judde.

Hôpital de la Pitié. Ophthalmologist, Coutela; associate, Weissmann-Netter; extern, Hervaux.

Hôpital Saint-Antoine. Ophthalmologist, Cerice; associate, Neda; externs Lelièvre, Faucher.

Hôpital Cochin. Assistant, Bollack.

Hôpital Beaujon. Cantonnet; intern, Bussan; externs, Ulmann, Besson.

Lariboisière. Ophthalmologist, Morax; assistant, Hartmann; intern, Kalt, J. Blum; externs, Elboz, Pucinnelli, Wauthier, Camps.

Tenon. Ophthalmologist, Magitot; assistant, Lagrange; intern, Dartin.

Hôpital Laennec. Ophthalmologist, Monthus; intern, Parfionry.

Hôpital St. Louis. Ophthalmologist, Dupuy-Dutemps; assistant, Charpentier; intern, Cadilhas; externs, Rouchand, Dupuy-Dutemps, Le Guet, Gauthier.

Hôpital des Enfants-Malades. Poulard; assistant Lavat; intern, Hudelo; externs, Maravel, Josset, Péchenard.

Hôpital Trousseau. Assistant, Velter; externs, Solignac, Baillot.

## Current Literature

These are the titles of papers bearing on ophthalmology. They are given in English, some modified to indicate more clearly their subjects. They are grouped under appropriate heads, and in each group arranged alphabetically, usually by the author's name in *heavy-faced type*. The abbreviations means: (Ill.) illustrated; (Pl.) plates; (Col. Pl.) colored plates. Abst. shows it is an abstract of the original article. (Bibl.) means bibliography and (Dis.) discussion published with a paper.

### BOOKS

- Falchi, F.** Commemorazione del Priomo Centenario della clinic Oftalmica di Pavia. Paper, octavo, 111 p., illustrated, Pavia. Tipografia Cooperativa di Pavia, 1924. Amer. Jour. Ophth., 1926, v. 9, pp. 219-220.
- Helmholtz's Treatise on Physiologic Optics.** Translated from 3rd German Edition. Cloth, large 8vo., 748 p., 6 pl., and 78 illus. Pub. by Optical Society of America. Amer. Jour. Ophth., 1926, v. 9, pp. 217-218. (Also see Amer. Jour. Ophth., v. 7, p. 886 and v. 8, p. 850.)
- Marzio, A. Di.** Saggi di Oftalmologia, Anno. 1924. Paper, octavo, 96 pp., 12 illustrations and 4 plates in color. Rome, Stabilimento Tipografico Reginale. Amer. Jour. Ophth., 1926, v. 9, p. 220.
- Ohm, J.** Das Augenzittern als Gehirnstrahlung. Ein Atlas der Augenzitternkurven. Paper, octavo, 344 pages, 266 illustrations. Berlin and Vienna. Urban and Schwarzenberg, 1925. Amer. Jour. Ophth., 1926, v. 9, p. 219.
- Savage, G. C.** Ophthalmic Neuro-Myology. 2nd Edition. Cloth, small 8vo., 39 pl. and 12 illustrations. Pub. by the Author, Nashville, Tenn., 1926. Amer. Jour. Ophth., 1926, v. 9, p. 220.

### DIAGNOSIS

- Byers, W. G. M.** Microscopy of the living eye. (6 ills., bibl.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 634-646. C. E. S. O. S.
- Cruise, R.** Value of examination of eye in diagnosis. Practitioner, 1926, v. 116, pp. 23-32.
- Ferree, C. E., and Rand, G.** Illumination for acuity test, pupillometry and visual fields. (7 ills., bibl., 2 tables). Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 815-847. C. E. S. O. S.
- Folinea, Barbato and Padovani.** Slitlamp examination with aid of vital staining. Soc. Francaise d'Opht., 1925, pp. 387-391.
- Goulden, C.** Microscopy of the living eye. (1 pl.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 718-722. C. E. S. O. S.
- Herzog, A. W.** Visual acuity and visual efficiency. Medicolegal Journal, 1925, v. 42, p. 136.
- Koepppe, L.** Limitations of slitlamp microscopy of living eye and the possibility of overcoming them. (Bibl.) Amer. Jour. Ophth., 1926, v. 9, pp. 157-171.
- Lopez Lacarrere, J.** Microscopy of living eye. Annales de Oft., Feb., 1926, pp. 80-96.
- Marx, E.** Intraocular and intraspinal pressure. (15 ills., dis., bibl.) Trans. Ophth.

- Soc. of the United Kingdom, 1925, v. 45, pp. 531-546. C. E. S. O. S.
- Mawas, J.** Biomicroscopy of the eye in diagnosis of tumors. Soc. Francaise d'Opht., 1925, pp. 527-530.
- Mayou, M. S.** A slitlamp. (1 ill.) Brit. Jour. Ophth., 1926, v. 10, pp. 144-146.
- The open mind for rare diseases. Brit. Jour. Ophth., 1926, v. 10, p. 146.
- Olsho, S. L.** Red free filter for electric ophthalmoscope. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 814-815. C. E. S. O. S.
- Pesme, P., and Sierra, R. G.** Chromatic differentiation of conjunctival lymphatics with slitlamp. Arch. d'Opht., 1926, v. 43, pp. 93-97.
- Wood, D. J.** Utility of the slitlamp in ophthalmologic practice. (Dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 724-739. C. E. S. O. S.

### THERAPEUTICS.

- Barre, J.** Adrenalin with local anesthetics. Clin. Opht., 1926, v. 30, pp. 31-38.
- Baro, L.** Treatment of ocular diseases with ionotherapy. Arch. de Oft. Buenos Aires, 1926, v. 1, p. 185.
- Bourquin, E.** The faradic current and intraocular tension. Rev. Gén. d'Opht., 1925, v. 39, pp. 491-495.
- Butler, T. H. and Gillan, R. U.** Borocain in ophthalmology. Brit. Med. Jour., Jan. 16, 1926, p. 83.
- Carrere, L.** Local vaccination in ocular therapeutics. (Bibl.) Soc. Francaise d'Opht., 1925, pp. 398-420.
- Gaston, I. E.** Milk injections in ophthalmic diseases. (3 tables, bibl., dis.) Pacific Coast Oto-Ophth. Soc., 1925, pp. 116-124.
- Giri, D. V.** Milk injections. (Bibl., dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 740-769. C. E. S. O. S.
- Hildesheimer, S.** Targessin in ocular therapeutics. Klin. M. f. Augenh., 1926, v. 76, pp. 267-272.
- Kapuscinski, W.** Influence of pituitrin on ocular tension. Soc. Francaise, d'Opht., 1925, pp. 640-646.
- Lutz, A.** Intravenous use of urotropin. Von Graefe's Arch. f. Ophthal., 1925, v. 115. Abst., Amer. Jour. Ophth., 1926, v. 9, pp. 226-227.
- Macbeth, H. F.** Applications of ultraviolet ray in eye. Pacific Coast Oto-Ophth. Soc., 1925, pp. 44-48.
- Mayer, L. L.** Use of "Afenil"; a warning. (Bibl.) Amer. Jour. Ophth., 1926, v. 9, pp. 193-194.
- Nutt, A. B.** Treatment by artificial light. Brit. Jour. Ophth., 1926, v. 10, pp. 138-144.
- Post, L. T.** Tryparsamid. Amer. Jour. Ophth., 1926, v. 9, pp. 214-215.



Shorney, H. T. Protein therapy in affections of the eye. (Bibl.) *Med. Jour. of Australia*, Feb. 13, 1926, pp. 177-179. Dis., p. 196.

#### OPERATIONS.

Best. Illumination in operative ophthalmology. *Klin. M. f. Augenh.*, 1926, v. 76, p. 276.

Friedenwald, H. and Friedenwald, J. S. Preparation of an aseptic field for operations on the eye. (3 tables, bibl.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 779-786. C. E. S. O. S.

Hamilton, W. General anesthesia in eye, ear, nose and throat surgery. *Kentucky Med. Jour.*, 1926, v. 24, pp. 146-152.

Iscoe, M. D. Intraorbital anesthesia. (Dis.) *Pacific Coast Oto-Ophth. Soc.*, 1925, pp. 98-103.

Hoorens. Immobilization of lids. *Soc. Francaise d'Opht.*, 1925, p. 473.

Lemoine and Valois. Anesthesia in ocular surgery. *Soc. Francaise, d'Opht.*, 1925, pp. 762-767.

Souttar, H. S., Ormond, A. W. and Kilner, T. P. Plastic operations in region of the eye. (Dis.) *Royal Soc. Med., Sec. on Ophth.*, Nov. 13, 1925. *Amer. Jour. Ophth.*, 1926, v. 9, pp. 210-213.

Wynn, J. J. Local anesthesia in eye, nose and throat surgery. *Kentucky Med. Jour.*, 1926, v. 24, pp. 127-134.

#### PHYSIOLOGIC OPTICS.

Parsons, J. H. The foundations of vision. (The Bowman Lecture, 1925). (Bibl.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 14-52. C. E. S. O. S.

Rossi, V. Vision and modern physics. (Bibl.) *Arch. di Ottal.*, 1926, v. 33, pp. 80-48.

A new theory of vision. (Bibl.) *Soc. Francaise d'Opht.*, 1925, pp. 239-253.

Smith, E. The evolution of binocular vision. (Dis.) *Trans. Ophth. Soc. of United Kingdom*, 1925, v. 45, pp. 53-82. C. E. S. O. S.

Vajda, G. v. Streiff's criticism of physiology of depth perception. *Klin. M. f. Augenh.*, 1926, v. 76, pp. 240-243.

#### REFRACTION.

Bhaduri, B. N. Unusual delay in regaining accommodation after cycloplegia. *Calcutta Med. Jour.*, 1925, v. 20, pp. 69-72.

Burdon-Cooper, J. Crystalline lens system in artificial cycloplegia and its influence on refraction of eye. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 386-392. C. E. S. O. S.

Butler, T. H. Astigmatism caused by chalcidion. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 900-901.

Claes, E. Refraction in United States. (Dis.) *Soc. Belge d'Opht.*, 1925, No. 51, pp. 80-86.

Clarke, E. Genesis of myopia. (3 charts, 1 pl., 2 tables, dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 373-386. C. E. S. O. S.

Cowan, A. Relation of aperture of eye to ocular function. *Amer. Jour. Ophth.*, 1926, v. 9, pp. 191-193. Also p. 204.

Dupuy-Dutemps and Perin. Transitory spasmodic myopia after arsenobenzol. *Ann. d'Ocul.*, 1926, v. 163, pp. 123-127.

Graves, B. Change of tension of lens capsule during accommodation under various drugs. *Brit. Med. Jour.*, 1926, Jan. 9, pp. 46-50.

Guglianetti, L. Maximum accommodation in normal subjects. (1 ill., bibl.) *Soc. Francaise d'Opht.*, 1925, pp. 289-309.

Hawley, C. W. Retinoscopy and its relation to refraction. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 399-404. C. E. S. O. S.

Henderson, T. Postural activity and evolution of ciliary muscle in mammalia: The mechanism of accommodation. (5 ills., bibl., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 521-531. C. E. S. O. S.

Marquez. Fundamental principle of skiascopy. (3 ills.) *Soc. Francaise d'Opht.*, 1925, pp. 269-286.

Newcomer, H. S. Mathematic analytic curves in correction of astigmatism. *Soc. Francaise d'Opht.*, 1925, pp. 254-269.

Nicholich, M. Anomalies of refraction. *Revista Med. de Malaga*, Sept., 1925.

Pi, H. T. Total peripheral aberration of the eye. (4 tables, bibl.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 393-399. C. E. S. O. S.

Rebay, H. Prisms optical action. (8 ills.) *Arch. de Oft. de Buenos Aires*, 1925, v. 1, pp. 98-108.

Concave glasses. (2 ills.) *Arch. de Oft. de Buenos Aires*, 1926, v. 1, pp. 175-180.

Rhoads, J. N. Vernier axiometer. (1 ill.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 810-814. C. E. S. O. S.

Ribas Valero, R. Asthenopia from lid pressure. *Lettura Oft.*, 1926, v. 3, pp. 13-21.

Rochon-Duvigneaud, A. Refraction of small eyes in animals. Use of retinal images. *Soc. Francaise d'Opht.*, 1925, p. 309-315.

Wegner, W. Spectacles in migraine. (Bibl.) *Klin. M. f. Augenh.*, 1926, v. 76, pp. 194-202.

#### OCULAR MOVEMENTS.

Adroque, E. Relation of semicircular canals to eye movements. (Bibl.) *Arch. de Oft. de Buenos Aires*, 1925, v. 1, pp. 77-88. *Arch. de Oft. de Buenos Aires*, 1926, v. 1, pp. 125-151.

Alexander, G. F. Physiology of ocular torsion. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 419-426. C. E. S. O. S.

Arkin, W. and Sterling, W. Monocular nystagmus. *Arch. d'Opht.*, 1926, v. 43, pp. 77-82.

Barton, M. Coal miners' nystagmus. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 890-897.

Colmant, J. Muscular advancement. (5 ills.) *Soc. Francaise d'Opht.*, 1925, pp. 719-724.

- Davidson, I. A.** Correction of strabismus by muscle resection. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 961-965.
- Dodds, L. G.** Congenital strabismus. *Arch. de Oft. de Buenos Aires*, 1926, v. 1, pp. 149-152.
- Duane, A.** Projection, visual and postural. (4 ill.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 497-521. C. E. S. O. S.
- Dunphy, E. B.** Nystagmus. *Boston Med. and Surg. Jour.*, 1926, v. 194, pp. 539-542.
- Dupuy-Dutemps, L.** Vertical diplopia with paralysis of externus and internus. (2 ill.) *Soc. Française d'Opht.*, 1925, pp. 706-718.
- Egan, B. W.** Divergent strabismus. (Dis.) *Jour. Ind. State Med. Assn.*, 1926, v. 19, pp. 101-108.
- Greene, A.** The scleral stitch in advancement operations. *Brit. Jour. Ophth.*, 1926, v. 9, p. 173.
- Hepburn, M.** Traumatic squint. *Royal Soc. Med. Sec. on Ophth.*, Nov. 13, 1925. *Amer. Jour. Ophth.*, 1926, v. 9, p. 209.
- Isakowitz.** Paretic contraction of ocular muscles. *Klin. M. f. Augenh.*, 1926, v. 76, p. 277.
- Jameson, P. C.** Muscle recession with scleral suturing for squint. (1 ill., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 405-419. C. E. S. O. S.
- Lewis, A. C.** Monocular diplopia. *Amer. Jour. Ophth.*, 1926, v. 9, p. 208.
- Maggiore, L.** Surgical cure of strabismus. *Ann. di Ottal. e Clin. Ocul.*, 1926, v. 54, pp. 305-322.
- Marburg, O.** Vertical visual movements. *Zeit. f. Augenh.*, 1926, v. 58, pp. 253-260.
- McCulloch, J. D.** Herpes zoster with paralysis of the sixth nerve. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 933.
- Montalti.** Morphology and embryology of oculomotor nuclei and trochlearis in man. (3 pl.) *Ann. di Ottal. e Clin. Ocul.*, 1926, v. 54, pp. 289-305.
- Mylius, K.** Isolated traumatic paralysis of superior rectus. *Zeit. f. Augenh.*, 1926, v. 58, pp. 295-298.
- Reese, W. S.** Muscle recession for correction of squint. *Amer. Jour. Ophth.*, 1926, v. 9, p. 201.
- Ricci, E.** Paralysis of externus, amblyopia and micropsia following spinal anesthesia. *Lettura Oft.*, Dec., 1926, pp. 564-586.
- Suffa, G. A.** Synergism of the ocular muscles. (1 ill., 6 tables) *Jour. Ophth. Oto. and Laryngol.*, 1926, v. 30, pp. 51-59.
- Undelt, J.** Tumor of pterygo-palatine fossa and Behr's symptom complex. *Zeit. f. Augenh.*, 1926, v. 58, p. 288.
- Wallart, J.** Cure of hyperopic convergent strabismus. (1 ill.) *Clin. Opht.*, 1926, v. 30, pp. 3-22.
- Weymann, M. F.** Reasons for early treatment of squint. (Dis.) *Calif. and Western Med.*, 1926, v. 24, pp. 338-340.
- Wiedersheim, O.** Etiology of convergent strabismus. (Bibl.) *Klin. M. f. Augenh.*, 1926, v. 76, pp. 243-251.

## CONJUNCTIVA.

- Adler, F. H.** Xerosis of conjunctiva. (Dis.) *Amer. Jour. Ophth.*, 1926, v. 9, pp. 199-200.
- Angelucci, A.** Autoserotherapy in trachoma. (1 ill.) *Soc. Française, d'Opht.*, 1925, pp. 363-369.
- Appleman, L. F.** Xerosis conjunctivae. *Amer. Jour. Ophth.*, 1926, v. 9, p. 199.
- Bailliant, P.** Conjunctival circulation. *Soc. Française d'Opht.*, 1925, pp. 325-329.
- Balbuena, F. F.** Varieties and occurrence of ocular mycosis. *Soc. Française d'Opht.*, 1925, pp. 437-441.
- Bickerton, H. R.** Unilateral outgrowth at the limbus; microscopic appearance of a lymphatic gland. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 947-949.
- Borrello, F. P.** Protective influence of conjunctival secretions. (Bibl.) *Ann. di Ottal. e Clin. Ocul.*, 1926, v. 54, pp. 322-348.
- Cazalis.** Etiology and pathogenesis of trachoma. (Bibl.) *Soc. Française d'Opht.*, 1925, pp. 348-358.
- Collin, L.** Infectious conjunctivitis in Annam. (2 ill.) *Arch. d'Opht.*, 1926, v. 43, pp. 98-101.
- Collin, L. and Schweisguth.** Subconjunctival iodine treatment of trachoma. *Soc. d'Opht. de Paris*, 1926, Jan., pp. 14-22. *Revue du Trachome*, 1925, Oct., pp. 134-142.
- Dejean, C.** Ocular pemphigus. *Rev. Gén. d'Opht.*, 1925, v. 39, pp. 363-369.
- Ellett, E. C.** Membranous conjunctivitis. (Dis.) *Amer. Jour. Ophth.*, 1926, v. 9, p. 207.
- Elschnig, A.** Massage of conjunctiva in chronic conjunctivitis. *Klin. M. f. Augenh.*, 1926, v. 76, p. 273.
- Fox, L. W.** Trachoma among the North American Indians. *Jour. Amer. Med. Assn.*, 1926, v. 86, p. 970.
- Gala, A.** Recovery and contagiousness of trachoma. *Bratislavske Lekarske Listy*, Nov., 1925, p. 56.
- Guibert.** Acute and chronic ocular pemphigus. *Soc. Française d'Opht.*, 1925, pp. 334-337.
- Kleefeld.** The role of diplobacillus. *Soc. Belge d'Opht.*, 1925, No. 51, pp. 96-100.
- Kuboki, Y.** Experimental phlyctenules in animals. *Klin. M. f. Augenh.*, 1926, v. 76, p. 297.
- Morax, V.** Etiology of trachoma. *Soc. Française d'Opht.*, 1925, pp. 14-21.
- Moutinho, M.** Distribution of trachoma in Portugal. (1 ill.) *Soc. Française d'Opht.*, 1925, pp. 338-347.
- Najditsch, B.** Hyalin degeneration of conjunctiva. *Zeit. f. Augenh.*, 1926, v. 58, pp. 299-302.
- Sgrosso.** Hematologic research on trachoma and other forms of conjunctivitis. *Soc. Française d'Opht.*, 1925, pp. 359-362.

- Swimming pool conjunctivitis. *Jour. Amer. Med. Assn.*, 1926, v. 86, p. 966.
- Vergne, J. Lesions after instillation of silver nitrate solution. *Soc. Française d'Opht.*, 1925, pp. 330-333.
- Zentmayer, W. Pemphigus of conjunctiva. (Dis.) *Amer. Jour. Ophth.*, 1926, v. 9, pp. 202-204.

## CORNEA AND SCLERA.

- Baker, M. C. Ulcer of cornea. *Kentucky Med. Jour.*, 1926, v. 24, pp. 121-124.
- Balbuena, F. F. Varieties of ocular mycosis. *Arch. de Oftal. Hisp.-Amer.*, 1926, v. 26, pp. 152-157. *Anales de Oft.*, Jan., 1926, pp. 28-30.
- Best, Luetic episcleritis. *Klin. M. f. Augenh.*, 1926, v. 76, p. 275.
- Borel, G. Etiology of blue sclera, and dystrophy of bones. *Soc. Française d'Opht.*, 1925, pp. 421-432.
- Brandes. Late neuromyasthenic keratitis after peripheral anesthesia. *Soc. Belge d'Opht.*, 1925, No. 51, pp. 70-72.
- Brown, A. L. Conjunctival flaps for superficial keratitis punctata. *Arch. of Ophth.*, 1926, v. 55, pp. 136-138.
- Chailous, J. and Coton, L. Bacteriotherapy of pneumococcal keratitis. *Soc. Française d'Opht.*, 1925, pp. 393-398.
- Dor, L. Keratoconus and filtering scleral cicatrix. *Soc. Française, d'Opht.*, 1925, pp. 385-387.
- Dufour, M. Heat in treatment of corneal erosion and ulcers. *Ann. d'Ocul.*, 1926, v. 163, pp. 128-132.
- Elewaut. Blue scleras. *Soc. Belge d'Opht.*, 1925, No. 51, pp. 73-75.
- Fox, L. W. Conical cornea: its surgical treatment. (5 ills., dis.) *Trans. Ophth. Soc. of United Kingdom*, 1925, v. 45, pp. 92-111. *C. E. S. O. S.*
- Jacqueau and Bujadoux. Panophthalmitis starting in yperite scars. (1 ill.) *Soc. Française d'Opht.*, 1925, pp. 370-380.
- Kleefeld. Biomicroscopy of cornea. *Soc. Belge d'Opht.*, 1925, No. 51, pp. 92-96.
- Lamb, R. S. Corneal ulcer. *Virginia Med. Mo.*, 1926, v. 52, pp. 728-730.
- Lampert. Corneal scars examined with the slitlamp. *Soc. Française d'Opht.*, 1925, pp. 391-392.
- Marx, E. Sensibility of human cornea. (102 pp., 24 ills.) *S. Hirzel, Leipzig*, 1925.
- Matthews, J. C. and Cohen, H. Dystrophie myotonica (corneal changes). *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 953-954.
- Metzger, E. Origin of corneal stria. (Fuchs) (1 ill.) *Klin. M. f. Augenh.*, 1926, v. 76, pp. 202-205.
- Parodi, L. Marginal keratitis. (1 ill.) *Arch. de Oft. de Buenos Aires*, 1926, v. 1, pp. 153-155.
- Phinney, F. D. Treatment of corneal ulcers with electrothermophore. *Ohio State Med. Jour.*, 1926, v. 22, pp. 127-130.
- Reese, W. S. Tuberculous keratitis. *Amer. Jour. Ophth.*, 1926, v. 9, p. 200.

- Safar, K. Pyocyanus infection of cornea. (2 ills.) *Zeit. f. Augenh.*, 1926, v. 58, pp. 269-274.
- Uribe Troncoso, M. Epithelial dystrophy of the cornea. (Dis.) *Arch. of Ophth.*, 1926, v. 55, p. 165.
- Van Duyse, M. Corneal complications with Basedow's disease. (2 ills., bibl.) *Soc. Belge d'Opht.*, 1925, No. 51, pp. 75-80.
- Weill, G. and Jost, A. Fibrous bands in cornea following heredospecific parenchymatous keratitis. (2 ills.) *Ann. d'Ocul.*, 1926, v. 163, pp. 100-114.
- Wibo. Coloboma of cornea. *Soc. Française d'Opht.*, 1925, pp. 380-384.

## ANTERIOR CHAMBER AND PUPIL.

- Angelucci, A. Mechanism of pupil movements. *Arch. di Ottal.*, 1925, v. 32, pp. 529-537.
- Arjona Trapoti, J. Argyll Robertson sign. *Anales de Oft.*, Nov., 1925, pp. 619-636 and Dec., 684-699; Jan., 1926, pp. 3-26; Feb., 1926, pp. 65-80.
- Benoit, F. Corneal angle and elimination of aqueous humor. (8 ills., dis.) *Soc. Belge d'Opht.*, 1925, No. 51, pp. 32-47.
- Bruynoghe and Staquet. Alexin elements in aqueous. *Rev. Gén. d'Opht.*, 1925, v. 39, p. 376.
- Danis, M. and Coppez, J. H. Examination of pupil; normal and pathologic. *Jour. de Neurologie et de Psychiatrie*, Dec., 1925.
- Graves, B. Anterior chamber, the aqueous fluid and the iris. (3 ills.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 683-695. *C. E. S. O. S.*
- Guillain, G., Perisson and Thevenard. Argyll Robertson pupil in child of four years. *Soc. Méd. des Hôp.*, Feb. 12, 1926. *Abst., Gaz. des Hôp.*, 1926, v. 99, p. 235.
- Isinski. Influence of proteolytic ferments on albumin contents of aqueous humor. *Soc. Française d'Opht.*, 1925, pp. 433-436.
- Inman, W. S. Nonluetic Argyll Robertson pupil. *Brit. Med. Jour.*, 1925, Dec., 19, p. 1179.
- Moore, R. F. Nonluetic Argyll Robertson pupil. *Brit. Med. Jour.*, 1925, Nov. 7, p. 843.
- Paton, L. and Mann, I. C. Development of third nerve nucleus bearing on the Argyll Robertson pupil. (16 ills., bibl.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 610-633. *C. E. S. O. S.*

## UVEAL TRACT.

- Addario La Ferla, G. Trachoma serum in treatment of tuberculous iridocyclitis. *Lettura Oft.*, 1925, Nov., pp. 513-517.
- Argañaraz, R. Syphilis and rheumatism etiologic factors in affections of uveal tract. *Arch. de Oft. de Buenos Aires*, 1925, v. 1, pp. 61-70.
- Bride, T. M. Cyst of the iris. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 929.
- Dodds, L. G. Colloid excrescences in lamina vitrea and choroid. *Arch. de Oft. de Buenos Aires*, 1925, v. 1, p. 109.



- Kleefeld, G. Buccal vaccinothrapy in gonococcal iritis. *Soc. Française d'Opht.*, 1925, pp. 449-455.
- Lewis, P. M. Endophthalmitis. (Dis.) *Amer. Jour. Ophth.*, 1926, v. 9, p. 208.
- Menacho, M. Anomalies of iris. (80 ills.) *Arch. de Oft. Hisp.-Amer.*, 1926, v. 26, pp. 65-118.
- Oliver, W. M. B. Cyclitis. *Royal Soc. of Med. Sec. on Ophth.*, Nov. 13, 1925. *Amer. Jour. Ophth.*, 1926, v. 9, p. 210.
- Rollet, Iritis and zoster. *Soc. Française d'Opht.*, 1925, pp. 442-449.
- Röthh, A. Phacoanaphylactic endophthalmitis. (3 tables, bibl.) *Arch. of Ophth.*, 1926, v. 55, pp. 103-112.
- Valude. Acute syphilitic hemorrhagic iritis. *Acad. de Méd.*, Feb. 26, 1926. *Abst., Gaz. des Hôp.*, 1926, v. 99, p. 235.
- Wolfrum, M. Microscopic anatomy of iris. *Graefe-Saemisch. Handb. der gesamten Augenheilkunde*, pages 1-218, 57 ills. Kap. III, Bd. 1.
- SYMPATHETIC DISEASE.**
- Crawley, F. Sympathetic ophthalmitis two months after enucleation of injured eye. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 958-959.
- Jeandelize and Barail. Sympathetic ophthalmia treated with salicylate of soda. (Dis.) *Soc. Française d'Opht.*, 1925, pp. 670-675.
- Steele, L. L. Escape from sympathetic ophthalmia. *Brit. Med. Jour.*, 1926, Jan. 30, p. 187.
- Terson, A. Sympathetic ophthalmia and hereditary syphilis. *Soc. Française d'Opht.*, 1925, pp. 664-670.
- Truc, H. and Dejean, C. Sympathetic ophthalmia after extraction of cataract. (7 ills.) *Soc. Française d'Opht.*, 1925, pp. 646-663.
- Woods, A. C. Uveal pigment in diagnosis and treatment of sympathetic ophthalmia. (2 tables, 5 charts, 2 ills., bibl., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 208-251. C. E. S. O. S.
- GLAUCOMA.**
- Addario La Ferla, G. Hypercholesterinemia and chronic glaucoma. *Lettura Oft.*, 1925, Dec., pp. 549-564.
- Cohen, M. Model illustrating the combined principles of manometry and tonometry. (Dis.) *Arch. of Ophth.*, 1926, v. 55, pp. 168-170.
- Durr, S. A. Operations for glaucoma. (Bibl.) *Amer. Jour. Ophth.*, 1926, v. 9, pp. 174-177.
- Gallemaerts. Examination of infantile glaucoma with slitlamp. (3 ills.) *Soc. Française d'Opht.*, 1925, pp. 201-211.
- Herbert, H. A new glaucoma theory. (9 ills.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 333-355. C. E. S. O. S.
- Kerry, R. The pathogenesis of glaucoma. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 355-368. C. E. S. O. S.
- Lagrange, F. Treatment of infantile glaucoma. (47 ills., 3 col. pl., bibl.) *Soc. Française d'Opht.*, 1925, pp. 3-197.
- Léplat, G. Variations of tension of traumatic origin. (1 ills.) *Soc. Française d'Opht.*, 1925, pp. 636-639.
- Poulard and Lavat. Scleroidectomy in infantile glaucoma. (Dis.) *Soc. Française d'Opht.*, 1925, pp. 212-232.
- Reid, A. C. A septic origin of elevated intraocular tension. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 898-900.
- Rowan, J. Glaucoma: Thrombosis of central vein; failure of iridectomy. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 369-372. C. E. S. O. S.
- Ruszkowski, J. One hundred Lagrange operations for glaucoma. *Klin. M. f. Augenh.*, 1926, v. 76, p. 316.
- Waite, J. H., Derby, G. S. and Kirk, E. B. Light sense in early glaucoma, achromatic scotopic threshold at the macula. (10 ills., bibl., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 301-333. C. E. S. O. S.
- Whitehead, A. L. Acute glaucoma (right) at age of 12. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 932.
- Woodruff. Operative procedures for glaucoma. (Dis.) *Amer. Jour. Ophth.*, 1926, v. 9, pp. 43-47.
- CRYSTALLINE LENS.**
- Alonso, A. F. Surgical treatment of congenital cataract. *Arch. d' Opht.*, 1926, v. 43, pp. 70-76.
- Angelucci, A. Iontophoresis in mechanical cure of cataract. (3 ills.) *Arch. di Ottal.*, 1926, v. 33, pp. 1-29.
- Bell, G. H. Operation in two stages for juvenile cataracts. (Dis.) *Arch. of Ophth.*, 1926, v. 55, pp. 165-168.
- Bride, T. M. Congenital dislocation of lenses in brothers. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 927-928.
- Borsch, L. Preventive treatment of cataract. *Soc. Française d'Opht.*, 1925, pp. 469-472.
- Busacca, A. Histology of black cataract. (1 pl.) *Rev. Gén. d'Opht.*, 1925, v. 39, pp. 439-445.
- Butler, T. H. Suspension of the lens. (29 ills.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 657-683. C. E. S. O. S.
- Removal of congenitally dislocated lens. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 870.
- Davis, A. E. The lens antigen treatment of cataract. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 186-204. C. E. S. O. S.
- Deichler, L. W. Ziegler thru and thru operation for traumatic cataract. *Amer. Jour. Ophth.*, 1926, v. 9, p. 197. Dis. p. 204.
- Derer, J. Operation for senile cataract. *Bratislavske Lekarske Listy*, Nov., 1924, p. 20.

- Hern, J. Operation for removal of cataract in its capsule. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 116. C. E. S. O. S.
- Hoorens. Conjunctival suture in cataract extraction. *Soc. Française d'Opht.*, 1925, pp. 490-492.
- Isakowitz. Myotonia dystrophy with cataract. *Klin. M. f. Augenh.*, 1926, v. 76, p. 277.
- Kalt. Results of extraction of lens in cataract operations. *Soc. Française d'Opht.*, 1925, pp. 493-496.
- Knapp, A. Late results of intracapsular cataract extraction. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 117-127. C. E. S. O. S.
- Knorr, E. A. Senile cataract extraction. *Amer. Jour. Ophth.*, 1926, v. 9, pp. 186-190.
- Langdon, H. M. Blood chemistry of patients with primary cataract. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 204-207. C. E. S. O. S.
- Mann, I. C. Correlation of embryology of lens with slitlamp appearances. (17 ills., bibl.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 696-718. C. E. S. O. S.
- Sachs, M. Time to operate for cataract? *Wiener klin. Woch.*, 1926, v. 39, p. 306.
- Saint Martin. Results of cataract extraction with conjunctival flap and Barraquer method. *Soc. Française d'Opht.*, 1925, pp. 496-504.
- Salva. Operation for cataract with conjunctival flap. *Soc. Française d'Opht.*, 1925, pp. 481-484.
- Sinclair, A. H. H. Intracapsular extraction of cataract with new instruments. (6 ills., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 127-154. C. E. S. O. S.
- Sisson, R. J. Nonoperative treatment of cataract. *Jour. Mich. State Med. Soc.*, 1926, v. 25, p. 17.
- Thomas, F. C. Delirium following cataract operations. *Kentucky Med. Jour.*, 1926, v. 24, pp. 134-143.
- Vacher and Denis. Hernia of Iris and cataract. *Soc. Française d'Opht.*, 1925, pp. 475-480.
- Van Lint. Operation for cataract with conjunctival flap. *Soc. Française d'Opht.*, 1925, pp. 485-490.
- Viterbi. Examination of cataract with slitlamp before and after operation. (9 ills., 2 col. pl.) *Soc. Française d'Opht.*, 1925, pp. 504-527.
- Ziegler, S. L. Disclission of lens, with technic of complete disclission by the V-shaped method. (4 ills., bibl., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 154-186. C. E. S. O. S.
- VITREOUS HUMOR.**
- Bedell, A. J. A study of the vitreous with the slitlamp. (4 pl., 5 ills.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 646-657. C. E. S. O. S.
- Matthews, J. C. and Cohen, H. Eales' disease (hemorrhage into vitreous). *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 954-955.
- Pavia, J. L. Hernia of vitreous. *Arch. de Oft. de Buenos Aires*, 1925, v. 1, p. 110.
- RETINA.**
- Belgeri and Pavia, J. L. Detachment of retina. *Arch. de Oft. de Buenos Aires*, 1925, v. 1, p. 109.
- Coppez, H. and Danis, M. Angioid streaks in retina. (10 ills., 3 col. pl., bibl.) *Soc. Française d'Opht.*, 1925, pp. 560-574.
- Fison, J. Angioid streaks of retina in both eyes. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 933.
- Friedenwald, H. and Friedenwald, J. S. Globular masses on the pupillary margin in acute circumscribed chorioretinitis. (13 ills., 1 table). *Arch. of Ophth.*, 1926, v. 55, pp. 113-124.
- Gonin, J. Operative treatment of detachment of retina. (4 ills., dis.) *Soc. Française d'Opht.*, 1925, pp. 614-626.
- Hallett, De W. Hole in the macula. *Jour. Ophth., Oto., and Laryngol.*, 1926, v. 30, pp. 60-62.
- Hambresin. Spasm of central artery of retina. *Soc. Belge d'Opht.*, 1925, pp. 22-24.
- Holmes, G. and Paton, L. Cerebromacular degeneration (juvenile form of amaurotic family idiocy). (6 ills., bibl., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 447-470. C. E. S. O. S.
- Horton, J. J. Coloboma of macula with other congenital anomalies. *Amer. Jour. Ophth.*, 1926, v. 9, pp. 196-197.
- Mooney, H. C. Retinal hemorrhages in each eye, with increase of tension. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 958.
- Neulen, E. N. Central retinal hemorrhage synchronous with menstruation. (3 ills., dis.) *Pacific Coast Oto-Ophth. Soc.*, 1925, pp. 31-36.
- Noiszewski, C. Monocular polyopia. *Soc. Française d'Opht.*, 1925, p. 287.
- Rosa, G. de. Degeneration of macula in microphthalmos. *Arch. di Ottal.*, 1925, v. 32, pp. 540-544.
- Scalinci, N. Retinal angiopathy. (3 ills.) *Ann. di Ottal. e Clin. Ocul.*, 1926, v. 54, pp. 360-366.
- Sloan, H. L. Idiopathic detachment of retina with operation and recovery. (Dis.) *Southern Med. Jour.*, 1926, v. 19, pp. 228-232.
- Tomlinson, J. H. Comparative brightness values of two eyes and single eye. (6 ills., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 547-554. C. E. S. O. S.
- Truc and Opin. Family hereditary hemeralopia. (2 charts) *Soc. Française d'Opht.*, 1925, pp. 626-631.
- Weekers, L. Experimental detachment of retina. (29 ills., Dis.) *Soc. Française d'Opht.*, 1925, pp. 574-612.
- Weizenblatt. Anastomoses of retinal and choroidal vessels. *Klin. M. f. Augenh.*, 1925, v. 76, p. 278.

- Wildi, G. Degenerative fundus changes with angiod streaks in retina. (2 pl.) *Klin. M. f. Augenh.*, 1926, v. 76, pp. 177-194.
- Williamson-Noble. Filament in macula. (Dis.) *Royal Soc. of Med. Sec. on Ophth.*, Nov. 13, 1925. *Amer. Jour. Ophth.*, 1926, v. 9, p. 210.
- Wolffsohn-Jaffe. Retinal angiomas. *Klin. M. f. Augenh.*, 1926, v. 76, p. 277.
- Zentmayer, W. Retinal degeneration. *Amer. Jour. Ophth.*, 1926, v. 9, pp. 201-202.

#### TOXIC AMBLYOPIAS.

- Bywater, H. H. and Plummer, F. C. Quinin amaurosis. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 949.
- Maxwell, E. Optic atrophy following ingestion of 2½ oz. of wood alcohol. (Dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 959.
- Plummer, F. C. Quinin amblyopia. *Brit. Med. Jour.*, 1925, Dec. 5, p. 1062.

#### OPTIC NERVE.

- Arjona Trapate, J. Postneuritic atrophy with lacrimal pericystitis. *Anales de Oft.*, Nov., 1925, p. 654.
- Behr, C. Tabetic optic nerve atrophy. *Münch. med. Woch.*, 1926, v. 73, pp. 311-313; pp. 366-369.
- Bertran, F. Retrobulbar neuritis and sphenoid disease. (5 ills.) *Anales de Oft.*, Nov., 1925, pp. 636-654.
- Bigland, D. A. Primary optic atrophy. (5 tables, dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 935-942.
- Calmettes and Giscard. Optic atrophy of syphilitic origin. *Soc. Anat.-Clin. de Toulouse*.
- Dollfus, M. A. Subacute optic neuromyelitis. (Bibl.) *Ann. d'Ocul.*, 1926, v. 163, pp. 115-122.
- Heckford, F. Ten cases of acute retrobulbar neuritis. *Brit. Med. Jour.*, 1926, Jan. 16, p. 93.
- Jones, H. E. Optic neuritis arising from different causes. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 950-953.
- Jordan, H. C. Retrobulbar neuritis. *Brit. Med. Jour.*, 1926, Jan. 23, p. 167.
- Jones, E. Acute unilateral retrobulbar neuritis. *Gaz. des Hôp.*, 1926, v. 99, pp. 197; 229.
- Lasalle, A. Edema of both optic discs. *Canadian Med. Assoc. Jour.*, 1926, v. 16, p. 294.
- Loeb, C. Choked disc and vitreous opacities following fracture of skull. (Bibl.) *Amer. Jour. Ophth.*, 1926, v. 9, pp. 184-186.
- Luque, C. E. False posthemorrhagic amaurosis. *Anales de Oft.*, 1926, pp. 96-101.
- Marbaix. Cranial hypertension and papillary stasis. (Dis.) *Soc. Belge d'Opht.*, 1925, No. 51, pp. 54-63.
- Marin Amat, M. Bilateral optic neuritis with sphenoid and ethmoid disease. (5 ills.) *Anales de Oft.*, Jan., 1926, pp. 30-47.
- Matthews, J. C. and Cohen, H. Secondary optic atrophy (due to dengue). *Trans.*

*Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 954.

- Nitsch. Changes in optic nerve with carcinomatous meningitis. *Klin. M. f. Augenh.*, 1926, v. 76, p. 278.
- Noizewski, C. Influence of craniectomy on lamina cribrosa and papilla of optic nerve. *Soc. Française d'Opht.*, 1925, p. 631.
- Pillat, A. Pulsating movements of optic nerve in papillitis. (1 ill.) *Zeit. f. Augenh.*, 1926, v. 58, pp. 275-281.
- Watson-Williams, P. Retrobulbar neuritis. *Brit. Med. Jour.*, Jan. 30, 1926, p. 221.
- Worster-Drought, C. Hirschsprung's disease with optic atrophy and old choroiditis. *Pro. Royal Soc. Med.*, Dec., 1925. *Abst., Lancet*, Feb. 20, 1926, p. 217.
- Young, G. Peripapillary ectasia. (3 ills., bibl.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 267-273. C. E. S. O. S.

#### VISUAL TRACTS AND CENTERS.

- Anderton, G. Temporary blindness after concussion. *Brit. Med. Jour.*, Nov. 28, 1925, p. 1005.
- Bourguet, J. Surgical treatment of tumors of hypophysis. *Soc. Française d'Opht.*, 1925, p. 756.
- Davenport, R. C. Recovery of visual field without operation in pituitary tumor. (6 ills., dis.) *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 472-490. C. E. S. O. S.
- Elliot Smith, G. Right handedness and left handedness. *Brit. Med. Jour.*, 1925, Dec. 12, pp. 1107-1109.
- Fanning, J. Temporary blindness after concussion. *Brit. Med. Jour.*, 1925, Dec. 26, p. 1224.
- Jones, H. E. and Mather, H. Tumor of the sphenomaxillary fossa (?). *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, p. 953.
- Kleist, K. Field of vision of single eye. *Klin. Woch.*, 1926, v. 5, p. 3. *Abst., Jour. Amer. Med. Assn.*, 1926, v. 86, p. 990.
- Pinard, M. Ophthalmic migraine and scotoma. *Medicine*, 1925, v. 7, p. 152. *Abst., Jour. Amer. Med. Assn.*, 1926, v. 86, p. 725.
- Rowland, W. D. Field and fundus changes in endocrin dysfunction. (6 ills., bibl.) *Amer. Jour. Ophth.*, 1926, v. 9, pp. 178-183.
- Samojloff, A. J. Scotoma charts. (4 ills.) *Zeit. f. Augenh.*, 1926, v. 58, pp. 282-287.
- Sargent, P. and Carmichael, E. C. Treatment of pituitary tumors. *Trans. Ophth. Soc. of the United Kingdom*, 1925, v. 45, pp. 470-472. C. E. S. O. S.
- Smeesters, J. Visual fields in pregnancy and iritis. *Soc. Belge d'Opht.*, 1925, No. 51, pp. 86-92.
- Wibo. Technic of trephining intracranial tumors. *Soc. Belge d'Opht.*, 1925, No. 51, pp. 48-54.
- Wilbrand, H. Macular vision in hemianopsia. *Zeit. f. Augenh.*, 1926, v. 58, pp. 261-268.
- Zeeman, W. P. C. Distribution of optic fibers in primary centers and paths. *Soc. Française d'Opht.*, 1925, pp. 632-636.



## COLOR VISION.

- Hartung, H. Family color anomaly. (1 ill.) Klin. M. f. Augenh., 1926, v. 76, pp. 229-240.
- Jennings, J. E. Test of color perception. Amer. Jour. Ophth., 1926, v. 9, p. 221.
- Samojloff, A. J. Clearness of spectral colors in protanopes. (3 ills.) Klin. M. f. Augenh., 1926, v. 76, pp. 214-229.
- Toulant. Dyschromatopsia following neuroretinitis. Soc. d'Opht. de Paris, 1926, Jan., pp. 11-14.

## EYEBALL.

- Bramley-Moore, A. A. Spontaneous rupture of eyeball. Canadian Med. Assoc. Jour., 1926, v. 16, p. 299.
- Fisher, J. H. Intraocular lymph paths. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 288-300. C. E. S. O. S.
- Pavia, J. L. Ossification of eye. (7 ills.) Arch. de Oft. de Buenos Aires, 1926, v. 1, pp. 132-142.
- Woollard, H. Congenital anophthalmus in a puppy. (1 ill., 2 pl., bibl.) Brit. Jour. Ophth., 1926, v. 10, pp. 131-138.

## LACRIMAL APPARATUS.

- Cordero y Soroa, J. Operations for lacrimal fistula. Arch. de Oft. Hisp.-Amer., 1926, v. 26, pp. 167-170.
- Marin Amat, M. Hordeolum on lacrimal punctum. Anales de Oft., Jan., 1926, pp. 26-28.
- Marquez, G. Indications and contraindications for dacryocystorhinostomy. Arch. de Oft. Hisp.-Amer., 1926, v. 26, pp. 133-152.
- Poyales, F. Nasolacrimal fistulization with extirpation. (10 ills.) Soc. Française d'Opht., 1925, pp. 316-323.
- Tallei, E. Prelacrimal cyst. Lettura Oft., 1925, Nov., pp. 495-513.
- Thomson, E. A. Dacryocystenectomy. (Dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 435-441. C. E. S. O. S.

## EYELIDS.

- Bonnet. Separable lid forceps for trichiasis. (5 ills.) Soc. d'Opht. de Paris, 1926, Jan., p. 10.
- Camison, A. Elephantiasis of lids. Arch. de Oft. Hisp.-Amer., 1926, v. 26, pp. 170-172.
- Colmant, J. Phlegmon of lids consecutive to meningitis. Soc. Belge d'Opht., 1925, No. 51, pp. 20-22.
- Cresswell, T. H. and Hofman, J. Bilateral ptosis treated by George Young's operation. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 955-956.
- Howe, S. S. "Jaw winking." Pacific Coast Oto-Ophth. Soc., 1925, pp. 92-93.
- Kraupa, E. Congenital entropion. Klin. M. f. Augenh., 1926, v. 76, p. 272.
- MacCallan, A. F. Treatment of trichiasis and entropion resulting from trachoma. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 83-91. C. E. S. O. S.

- MacCallan, A. F. and Peretz. Surgical treatment of trichiasis and entropion of trachomatous origin. Revue du Trachome, 1925, Oct., pp. 127-134.
- MacFetridge, W. C. Hysterical blepharospasm in a man, aet. 42 years. (Dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 960-961.
- Mercier, J. Study of palpebral edema. Paris Thesis, 1926.
- Pavia, J. L. Tuberculosis of meibomian glands. (2 ills.) Arch. de Oft. de Buenos Aires, 1925, v. 1, pp. 89-93.
- Satanowsky, P. Hysterical blepharospasm. Arch. de Oft. de Buenos Aires, 1925, v. 1, pp. 94-97.
- Temple-Smith, E. C. Entropion. Med. Jour. of Australia, Jan. 30, 1926, p. 145.
- Velhagen, K. Jr. Lateral displacement of lids in blepharophimosis and senile processes. (3 ills., bibl.) Klin. M. f. Augenh., 1926, v. 76, pp. 252-267.
- Villard, H. Marcus Gunn phenomenon. (3 ills., bibl., dis.) Soc. Française d'Opht., 1925, p. 725.
- Zentmayer, W. Entropion of lower lid corrected by graft from upper lid. Amer. Jour. Ophth., 1926, v. 9, p. 200.

## ORBIT.

- Baroni, B. Pulsatile exophthalmos. Arch. Ital. di Chir., 1925, v. 14, p. 225. Abst., Gaz. des Hôp., 1926, v. 99, p. 245.
- Benoit, A. Intermittent exophthalmos of nasal origin. (3 ills., dis.) Soc. Belge d'Opht., 1925, No. 51, pp. 63-70.
- Brazeau, G. N. Serous tenonitis. Arch. de Oft., 1926, v. 55, pp. 152-154.
- Delord, E. Recurring acute tenonitis. Soc. Française d'Opht., 1925, pp. 702-705.
- Frechin, M. Exophthalmos from sinus suppuration. Paris Thesis, 1926.
- Hay, P. J. Exophthalmos due to arteriovenous aneurysm. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, p. 956.
- Hett, G. S. Nasal causes of proptosis. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 428-434. C. E. S. O. S.
- Jones, A. C. Acute ethmoiditis with rupture into orbit. (Dis., bibl.) Pacific Coast Oto-Ophth. Soc., 1925, pp. 37-43.
- Morax, V. Orbital osteoperiosteitis and streptothricosis. (2 ills.) Soc. Française d'Opht., 1925, pp. 677-688.
- Plumer, J. S. Contracted sockets operated upon by method of Wheeler. Amer. Jour. Ophth., 1926, v. 9, p. 200.
- Van der Hoeve, J. Radiography of optical sinuses. Soc. Française d'Opht., 1925, pp. 689-700.

## INJURIES.

- Bandot. Peripheral retinal contusions. Rev. Gén. d'Opht., 1925, v. 39, p. 504.
- Baquis, E. Ocular injury. Ann. di Ottal. e Clin. Ocul., 1926, v. 54, pp. 349-355.
- Blue, J. B. Injury to eye from broken spectacles. (Dis.) Amer. Jour. Ophth., 1926, v. 9, p. 208.
- Bride, T. M. Foreign body in iris. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, p. 927.

- Orbital cyst due to indelible pencil injury. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 929-930.
- Butler, T. H. Changes seen with slitlamp in eyes injured or operated upon. (18 ills.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 871-884.
- Clegg, J. G. Treatment of penetrating wounds of the eye. (Dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 906-926.
- Comberg, Quicksilver in eye. Klin. M. f. Augenh., 1926, v. 76, p. 276.
- Hughes, J. A. Injury to cornea. (Dis.) Amer. Jour. Ophth., 1926, v. 9, p. 207.
- Jackson, E. Recent mechanical injuries to the eye, their examination and management. Southwestern Med., 1925, v. 9, pp. 466-471. Northwest Med., 1926, v. 15, pp. 138-142.
- Jones, E. L. Advantage of immediate maximum physiologic lymphatic reaction in dangerously wounded eyes. (Dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 770-779. C.E.S.O.S.
- Lagleyze, M. Intraocular foreign bodies. (2 ills.) Arch. de Oft. de Buenos Aires, 1925, v. 1, pp. 70-76.
- Lagrange, F. Concussion of membranes of eye with injury of head and face. (10 ills.) Ann. d'Ocul., 1926, v. 163, pp. 81-99. (2 ills.) Arch. d'Opht., 1926, v. 43, pp. 65-69.
- Mayou, S. Siderosis bulbi. (5 ills., bibl.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 274-287. C.E.S.O.S.
- Moore, R. F. Intracranial aneurysm, rupture of optic nerve diagnosed during life. (2 ills.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 490-496. C.E.S.O.S.
- Pischel, K. Localization of a foreign body in the eye by markers in the conjunctiva. Pacific Coast Oto-Ophth. Soc., 1925, p. 87.
- Pollock, W. B. I. Burn of cornea from carbolic acid, seen with slitlamp. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, p. 723-724. C.E.S.O.S.
- Rasquin. Extraction of shot from vitreous. (Dis.) Soc. Belge d'Opht., 1925, No. 51, pp. 25-31.
- Reina, H. Foreign body in the orbit. Amer. Jour. Ophth., 1926, v. 9, p. 207.
- Sgroso, S. Ocular affections from tincture of capelli. Arch. di Ottal., 1925, v. 32, pp. 545-556.
- Vega de la E. and Magdalena, A. Traumatic cyst of iris. Arch. de Oft. de Buenos Aires, 1926, v. 1, pp. 143-148.
- Verderber, H. Finger nail in anterior chamber after explosion injury to hand. Zeit. f. Augenh., 1926, v. 58, pp. 292-294.
- Vergne, J. Lesions after instillation of silver nitrate solution. Soc. Francaise d'Opht., 1925, pp. 330-333.
- Zachert, M. Extraction of intraocular foreign bodies. (3 ills.) Rev. Gén. d'Opht., 1925, v. 39, pp. 403-411.
- TUMORS.**
- Anderson, W. A. and Thomson. Intracranial chondroma. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, p. 965.
- Blaauw, E. E. Intraocular tumors. Arch. of Ophth., 1926, v. 55, pp. 159-164.
- Buchanan, M. Dermoid of orbit. Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 427-428. C.E.S.O.S.
- Butler, T. H. Slitlamp differential diagnosis between glioma and pseudoglioma. (3 ills.) Arch. of Ophth., 1926, v. 55, pp. 155-158.
- Melanotic tumor. (Dis.) Royal Soc. Med. Sec. on Ophth., Nov. 13, 1925. Amer. Jour. Ophth., 1926, v. 9, p. 210.
- Cazalis, C. A. Therapy of intraocular cancers. Arch. d'Opht., 1926, v. 43, pp. 83-86.
- Chance, B. Tuberculoma of iris and ciliary body. Amer. Jour. Ophth., 1926, v. 9, p. 200.
- Cridland, B. Tumor at the limbus. (Dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 897-898.
- Drak, J. Cystogenic adenoma of conjunctival limbus. (3 ills., bibl.) Arch. d'Opht., 1926, v. 43, pp. 87-92.
- Gerard, G. and Detroy. Glioma of retina and sarcoma of choroid. Clin. Opht., 1926, v. 30, pp. 22-31.
- Greeff. Glioma of retina in 7½ year old child. Klin. M. f. Augenh., 1926, v. 76, p. 277.
- Knapp, A. Large exostosis of orbit successfully removed by operation. (2 ills.) Arch. of Ophth., 1926, v. 55, pp. 128-130.
- Lewis, P. M. Sarcoma of the orbit. Amer. Jour. Ophth., 1926, v. 9, p. 209.
- Manzutto, G. Plasmoma of cornea. (Bibl.) Ann. di Ottal. e Clin. Ocul., 1925, v. 54, pp. 356-360.
- Mawas, J. Tumors of choroid called melanotic tumors. Soc. Francaise d'Opht., 1925, pp. 548-551.
- Oyenard, A. and Pavia, L. J. Hematoma of bulbar conjunctiva. (3 ills.) Arch. de Oftal. de Buenos Aires, 1926, v. 1, pp. 166-169.
- Pfingst, A. O. Neoplasms of the lacrimal gland. (3 ills.) Arch. of Ophth., 1926, v. 55, pp. 139-151.
- Possey, W. C. Melanosarcoma of the palpebral conjunctiva illustrating the malignancy of such growths. (Bibl.) Arch. of Ophth., 1926, v. 55, pp. 131-135.
- Redslob, E. Melanotic tumors of choroid. (2 ills.) Soc. Francaise d'Opht., 1925, pp. 531-548.
- Rutherford, C. W. Essentials of glioma of the retina. (4 ills.) Amer. Jour. Ophth., 1926, v. 9, pp. 171-174.
- Schlininke, A. Pseudotumors of orbit—Birch Hirschfeld. (4 ills., bibl.) Klin. M. f. Augenh., 1926, v. 76, pp. 207-213.
- Strada, F. and Zavalia, A. U. Carcinoma of the lacrimal sac. Semana Med., 1925, v. 2, p. 1100. Abst., Jour. Amer. Med. Assn., 1926, v. 86, p. 727.
- Van der Hoeve, J. Glioma retinae. (1 pl. 1 ill., dis., bibl.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 256-266. C.E.S.O.S.
- Osteoma of orbital walls. Soc. Francaise d'Opht., 1925, pp. 700-702.

White, H. V. Cavernous angioma of left orbit. *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 930-932.

Williamson-Noble, F. A. Sarcoma of choroid simulating simple glaucoma. (2 ills.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 251-255. C.E.S.O.S.

Wood, D. J. and Scott, R. S. Dermolipoma of the cornea. *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 112-115. C.E.S.O.S.

#### PARASITES.

Baquis, M. Ophthalmomiasis. *Lettura Oft.*, 1926, v. 3, pp. 1-13.

#### GENERAL PATHOLOGY.

Balbuena, F. F. Silver impregnation of retina and nervous centers. (Bibl.) *Soc. Francaise d'Opht.*, 1925, pp. 552-560.

Javis, F. A. Hereditary eye defects in rabbits experimentally induced. (8 ills., tables, bibl., dis.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 555-610. C.E.S.O.S.

Verhoeff, F. H. and Sisson, R. J. Basophilic staining of Bruch's membrane. (3 ills.) *Arch. of Opth.*, 1926, v. 55, pp. 125-127.

#### GENERAL AND EXTRAOCULAR DISEASES.

Adams. Diagnosis and treatment of tuberculous disease of the eye. (Dis.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 901-903.

Bail, L. Ocular manifestations of encephalitis lethargica. (Dis.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 884-889.

Clement, R. Ocular complications of sinus origin. *Presse Méd.*, 1926, March 6, p. 293.

Collier, J. Diffuse periaxial encephalitis. (Dis.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 443-447. C.E.S.O.S.

Fox, M. C. Mucocoele of frontal sinus, operation and recovery. (3 pl., bibl., dis.) *Pacific Coast Oto-Opht. Soc.*, 1925, pp. 81-86.

Gullan, A. G. Eye symptoms in lethargic encephalitis. (Bibl.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, p. 942-947.

Jackson, E. Ophthalmic aspects of general medicine. *Pacific Coast Oto-Opht. Soc.*, 1925, pp. 14-20.

McCulloch, J. D. Graves' disease with excessive proptosis followed by corneal ulcerations. (1 ill.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 934-935.

Mukherjee, S. K. Herpes zoster ophthalmicus. *Calcutta Med. Jour.*, 1925, v. 20, p. 153.

Nicoletti, G. Ocular symptoms in Flatau-Basedow's disease. (4 ills., bibl.) *Ann. di Ottal. e Clin. Ocul.*, 1926, v. 54, pp. 367-381.

Pfingst, A. O. Ocular complications of leprosy. *Amer. Jour. Opth.*, 1926, v. 9, pp. 195-196.

Pretori, R. Pigmentation of limbus, Kayser-Fleischer ring in Wilson's disease. *Klin. M. f. Augenh.*, 1926, v. 76, p. 206.

Rasquin. Syphilis and the eye. *Soc. Francaise d'Opht.*, 1925, pp. 759-762.

Simone, C. de. Four symptoms in hereditary lues. *Arch. di Ottal.*, 1925, v. 32, pp. 537-539.

Schwartz, W. A. The eye in nervous disease. *Southwestern Med.*, 1926, v. 10, pp. 116-118.

Temple Smith, E. C. Herpes zoster of the eye. *Med. Jour. of Australia*, Jan. 30, 1926, p. 145.

Witkina, E. M. and Makeskova, O. A. Tuberculosis of lungs, skin and eyes. *Beit. zur Klin. der Tuberkulose*, 1926, v. 63, p. 119-123.

Zavalia, A. U. Primary ocular hypertension in ophthalmic zona. *Arch. de Oft. Hisp.-Amer.*, 1926, v. 26, pp. 157-167.

#### VISUAL HYGIENE AND PROPHYLAXIS.

Annual report of the Department of Health, (Trachoma) Government of Palestine for 1924. *Brit. Jour. Opth.*, 1926, v. 10, p. 172.

Collins, E. T. The elimination of eye disease. (Presidential address.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 1-13. C.E.S.O.S.

Education of children suffering from defective vision. *Jour. Amer. Med. Assn.*, 1926, v. 86, p. 701.

Lessonarn. Causes and frequency of blindness in extreme Orient. *Soc. Belge d'Opht.*, 1925, No. 51, p. 47.

Lewis, F. P. Scope and possibilities of preventive measures in ophthalmology. (Dis.) *Trans. Opth. Soc. of the United Kingdom*, 1925, v. 45, pp. 802-809. C.E.S.O.S.

Thompson, L. R., Schwartz, L., Ives, J. E. and Bryan, N. P. Hygienic illumination in postoffices with especial relation to visual defects and efficiency. *Public Health Bull.*, No. 140. Govt. Printing Office, Washington, 1924.

#### OPHTHALMIC SOCIOLOGY.

Black, N. M. Compensation for loss of vision due to industrial diseases or injuries. *Wisconsin Med. Jour.*, 1926, v. 25, pp. 67-70.

Jackson, E. The needs of the blind and the new Colorado law. *Colorado Medicine*, March, 1926.

Kretschmer, R. History of education of blind in Breslau. *Klin. M. f. Augenh.*, 1926, v. 76, p. 319.

Lamb, H. D. Causes of blindness in youth. (9 tables.) *Jour. Mo. State Med. Assn.*, 1926, v. 23, pp. 101-104.

Lapersonne. Report on examination of vision of railway employes, chauffeurs, etc. (Dis.) *Arch. d'Opht.*, 1926, v. 43, pp. 106-112.

Proposed optical practitioners bill. *Brit. Jour. Opth.*, 1926, v. 10, pp. 148-150.

The closed mouth, proper professional reserve. *Brit. Jour. Opth.*, 1926, v. 10, pp. 146-148.

Tibbles, S. Errors of vision and aviation accidents. *Brit. Med. Jour.*, 1925, Nov. 21, p. 979.

Würdemann, H. V. Eyesight, education and economics. *Pacific Coast Oto-Opht. Soc.*, 1925, pp. 61-65.



# EDUCATION, HISTORY AND INSTITUTIONS.

- Aubaret, Jacques Daviel (1693-1762), the inventor of the French classic operation of cataract. (5 ill.)** Soc. Francaise d'Opht., 1925, pp. 455-464.
- Collins, E. T.** Reestablishment of International Ophthalmological Congresses on a Pre-War Basis. (Dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 848-863. C.E.S.O.S.
- Demets. Optics of Francois d'Aquillon. (1613) (1 ill.)** Soc. Francaise d'Opht., 1925, pp. 233-239.
- Fromaget, C. Louis Beranger, Bordelais oculist inventor of extraction of cataract in capsule. (1757) (1 ill.)** Soc. Francaise d'Opht., 1925, pp. 465-468.
- Hepburn, M. L.** The teaching of ophthalmology. (Dis.) Trans. Ophth. Soc. of the United Kingdom, 1925, v. 45, pp. 787-802. C.E.S.O.S.
- Jackson, E.** Original research. Amer. Jour. Ophth., 1926, v. 9, pp. 215-217.
- Ophthalmological meetings. Amer. Jour. Ophth., 1926, v. 9, p. 217.
- Landolt, M.** The emerald of Nero. Arch. d'Opht., 1926, v. 43, pp. 102-105.
- Lloyd, R. I.** History of ophthalmology in New York City. Amer. Jour. Ophth., 1926, v. 9, p. 198.
- Paparcone, E.** History. Antique origin of trachoma. (2 ill.) Rev. du Trachome, 1925, Oct., pp. 146-149.
- Roman oculist stamps in Britain. (10 ill.) Brit. Jour. Ophth., 1926, v. 10, pp. 113-131.
- Sedan, J.** Copper in trachoma therapy by the Romans. Rev. du Trachome, 1925, Oct., pp. 142-146.
- Southall, J. P. C.** Helmholtz and his work. Amer. Jour. Ophth., 1926, v. 9, pp. 198-199.
- The optical convention. Lancet, Feb. 27, 1926, p. 452.
- Van Duyse, D.** Were artificial eyes known to the ancients? Soc. Francaise d'Opht., 1925, pp. 22-27.